Rapid Assessment of Ecological Impacts of Camping Operations for River Rafting between Kaudiyala and Rishikesh along the River Ganga, Uttarakhand

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Rafting down River Ganga during the field assessment was the most exciting part of this study and we sincerely hope that citizens of this country as well as people form world over will continue to avail this exhilarating experience through responsible camping and river rafting.

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1.0. Background

River rafting is one of the most popular adventure sports in the Himalayan rivers. Rafting and setting up of temporary (tentage) camps at open banks or beaches if done in environmentally responsible manner, can be regarded as best form of land and river use in mountain valleys. This activity generates considerable livelihood opportunities for the local youth and also helps in increasing conservation awareness. The stretch of River Ganga between Kaudiyala and Rishikesh in Uttarakhand has gained prominence as a major destination for river rafting in India. This popular adventure sport attracts large number of tourists and adventure seekers from far and wide. River rafting in this part of Ganga made a low-key beginning in 1988 (Rajvanshi *et al.,* 2010) when the rafting companies sought permission from the Government of Uttar Pradesh to establish camps along the river. Permission for the establishment of temporary rafting camps along the river was issued in 1993 (vide letters 6713/14-2-93-944/1988 dated 28th October 1993 and 7429/14-2-93-944/1988 dated 4th April 1994).

The growth in this form of adventure tourism has been prolific and is clearly reflected in the increasing number of rafting camps along the Ganga (Figure 1). From just two camping sites owned by Garhwal Mandal Vikas Nigam (GMVN) and other two private camps between Kaudiyala and Rishikesh in 1994, the number went up to eight sites in 1997 scattered at four locations (Farooquee *et al.,* 2006), 12 sites in 1999 (Johnsingh *et al.,* 1999), 26 in 2006 and 34 in 2010 (Rajvanshi *et al.,* 2010). By December 2015 the number of camps sites reached 108 (*Appendix 1*).

This exponential growth of camping sites in past five years has led to major concerns on account of damage to the riparian forests, wildlife and pollution including non-biodegradable waste along the Ganga. Results of a detailed study published in 2008 indicated the violations of guidelines prescribed by the Government of Uttarakhand (Farooquee *et al.* 2008): www.currentscience.ac.in/.../article_id_094_05_0587_05940.pdf). A rapid Environmental Impact Assessment (EIA) carried out by the Wildlife Institute of India (WII) in 2010 (Rajvanshi et al. 2010, http://www.indiaenvironmentportal.org.in/files/SC Rafting_River_Ganga.pdf) clearly spelt out various best management practices for beach camp operations.

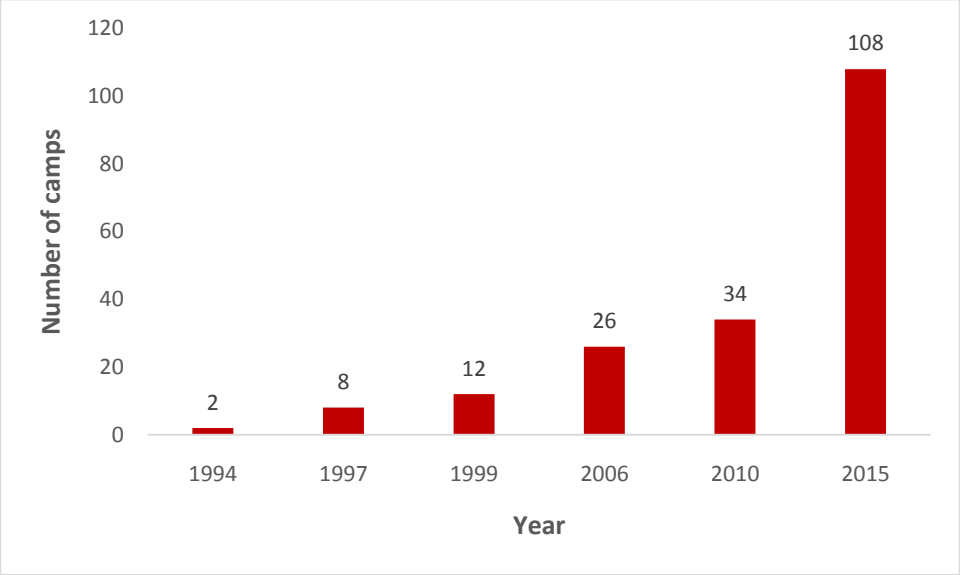

Figure 1. Exponential growth of beach camps for river rafting over the period along the Ganga between Kaudiyala and Rishikesh. The number during 2015 is based on current field investigation in January 2016.

However, unregulated camping operations and excessive use of beaches, surrounding forests and river banks along River Ganga have led to legal as well as environmental concerns thereby resulting in temporary closure of beach camps based on Hon'ble National Green Tribunal (NGT) Order dated 12 December 2015 (*Appendix 2)*. Although this stretch of River Ganga has been designated as an eco-tourism zone, the carrying capacity or number of camps has not yet been assessed. As per the directives of the Hon'ble NGT, the Government of Uttarakhand has assigned the task of carrying out a rapid assessment of the riverine stretch between Kaudiyala and Rishikesh and estimate the carrying capacity of beach camping sites as well as number of camps in these sites along this stretch to the WII (*Appendix 3*).

2.0. Objectives of the study

Ever since the inception of beach rafting camps along Ganga in 1988, no estimate of carrying capacity of number of beaches suitable for camping has been carried out. Considering the proliferation in number of beach rafting camps and the resulting legal issues arising out of it, this present study was carried out with the following two objectives:

a) To assess the size, area, number, wildlife use and suitability of the beaches for camping.

b) To assess the carrying capacity of the riverine stretch in terms of number of camping sites as well as the number of tents in each of the suitable camping area.

3.0. Survey Area

In the present rapid assessment, beach camps along the river Ganga between Kaudiyala and Rishikesh were surveyed from 14 to 24 January 2016. This area includes 36 km of river stretch between Kaudiyala and Rishikesh, which is located in the Garhwal region of Uttarakhand (Latitudes 30°4'27'N–30°7'23"N and Longitudes 78°29'59"E– 78°18'51"E). This rafting zone is located along the road from Rishikesh to Devprayag. There are 108 beach camps dotted along the banks of the river Ganga (Figure 2). Among the 108 camps, 37camps fall within the jurisdiction of Forest Department, 64 camps fall within revenue land (list of camps please see *Appendix 1*) and 7 camps are lying within Private lands. As the region is influenced by the southwest monsoon, river rafting is not carried out between June to October. The stretch between Kaudiyala and Rishikesh on either side of River Ganga can be categorized as Sub-tropical Broadleaf Forests, equivalent to Champion & Seth's 5B/C1a i.e., Dry sal bearing forests. Owing to poor soil and dry conditions, sal (*Shorea robusta*) is extremely localized and patchy in distribution. However, hill slopes are dotted with miscellaneous trees and grasses which provide natural habitat to local fauna.

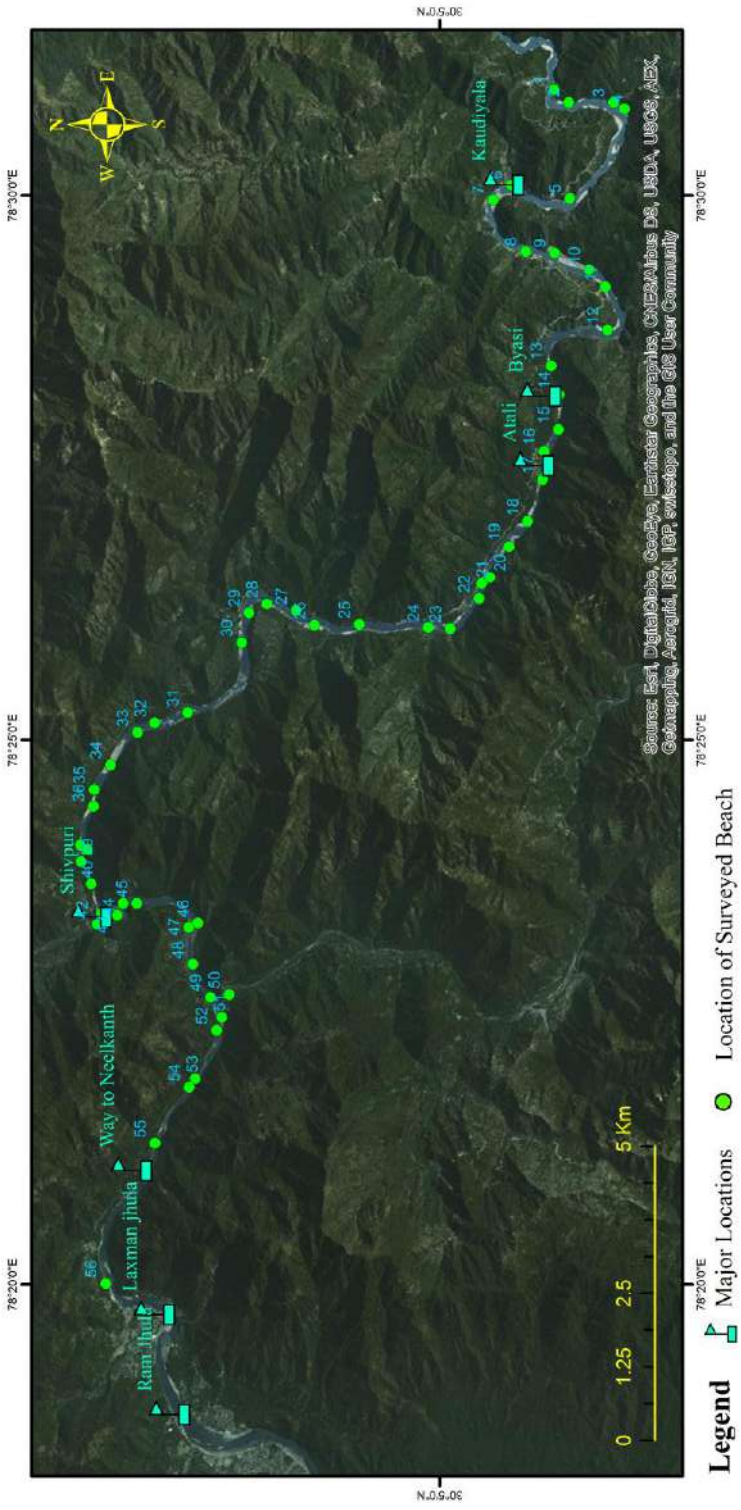

Figure 2. Map showing the study area in river Ganga between Rishikesh and Kaudiyala.

4.0. Approach and Methodology

The primary objective of this study was to assess the suitability of beaches for camping and estimating the number of camps which can be established along the River Ganga between Kaudiyala and Rishikesh without affecting the forests and natural habitat. The overall approach of this study is shown in the following flow chart (Figure 3). In this approach, an intensive field survey was carried out to map the area of each beach, occupancy, number and nature of tents (permanent or temporary) as well as waste management mechanism. Simultaneously, information on administrative status, number of beaches and tents allotted were obtained from District Administration and Forest Department. During the field survey, wildlife use around the beaches, quality of riparian vegetation along the beaches and vulnerability of beaches to degradation due to camping were assessed to determined the suitability of beaches for camping and also to assess the carrying capacity of camps along the river.

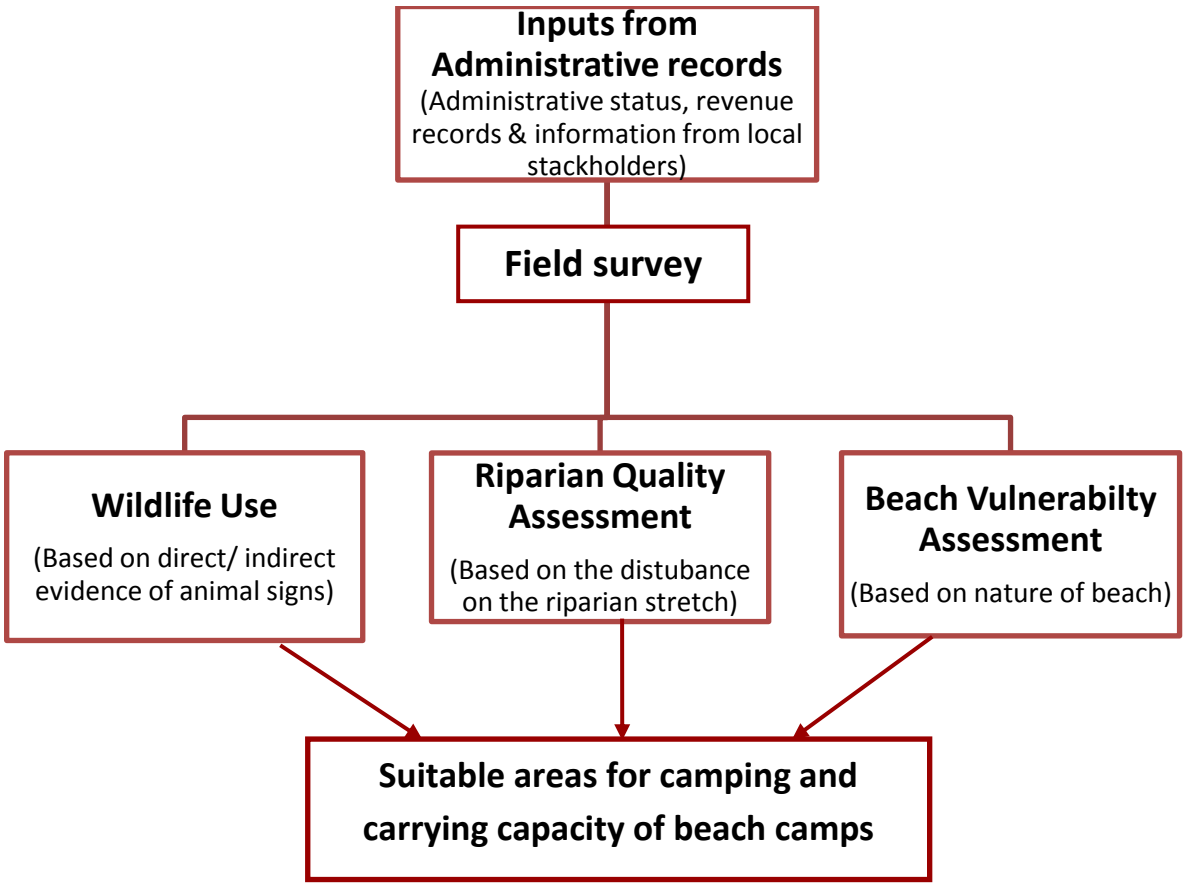

Figure 3. Flowchart showing the approach of present study.

4.1. Assessment of River Quality

Status and health of any aquatic ecosystem is determined by the diversity and quality of life associated with the habitat. Globally, the ecological status of a river is assessed based on the Environmental Management Class (EMC) of the river. The EMC is a management concept that has been developed and used globally because of a need to make decisions regardless of the limited hydro-ecological knowledge available (Smakhtin *et al.,* 2007). The definition of EMC should be based on existing empirical relationships between volume of water and ecological status/conditions, which are associated with clearly identifiable thresholds (Smakhtin *et al.,* 2007). In the present study, we followed the methodology prescribed by the International Water Management Institute (Smakhtin *et al.,* 2007) to assess the environmental management class of the river Ganga between Kaudiyala and Rishikesh using fish as major taxa for determining the health of the river. Mostly these EMC classes are directly related to the amount of flow required for sustenance of aquatic life. Here this concept is used to express the current condition of aquatic ecosystem in the river basin. A set of indicators and scoring systems were developed by Smakhtin *et al.* 2007 to identify the EMC for Indian river systems. The indicators and scoring system used in the present study are given in Table 1.

Table 1. A preliminary set of basin indicators, their scoring systems and justification (adopted from Smakhtin *et al.* 2007).

Indicator	Range	Score	Justification
Rare and endangered species	Very High High Moderate Minor None	5 4 3 2 1	The total number of rare and endangered species can be expressed as aquatic biota percentage of the total number of species in a country, region or basin—depending on the scale of analysis.
Unique aquatic biota	Very High High Moderate Minor None	5 4 3 2 1	The number of unique (endemic) species can be expressed as a percentage of the total number of species in a country, region or basin—depending on the scale of analysis.
Diversity of aquatic habitats	Very High High Moderate Minor None	5 4 3 2 1	This is based on the availability of different types of habitats such as pools, riffles, runs, secondary channels, adjoining small streams etc.
Presence of protected area, pristine area crossed by the main water course	Very High High Moderate Minor None	5 4 3 2 1	Based on the IUCN aim of 10% of the basin area to be protected.

Indicator	Range	Score	Justification
Sensitive of aquatic ecosystem to flow reduction	Very High High Moderate Minor None	5 4 3 2 1	Can be evaluated using professional judgment and knowledge of a river ecosystem to flow. A limited decrease in flow in some rivers may result in particular habitat types reduction (e.g., floodplains, riffles, pool, backwater channel) becoming unsuitable for biota.
Percentage of watershed remain under natural vegetation cover type	70-100% 50-70% 30-50% 10-30% <10%	5 4 3 2 1	Can be estimated using RS images, from literature sources or based on field surveys. These are measures of the extent to which natural vegetation communities have persisted in a watershed or a floodplain. An area that retains a high proportion of natural cover types may be expected to also have many ecosystem services.
Percentage of floodplain remain under natural vegetation cover type	>100% 50-100% 20-50% 10-20% <10%	5 4 3 2 1	
Degree of flow regulation	>100% 50-100% 20-50% 10-20% <10%	5 4 3 2 1	The first indicator is the total dam storage in a basin as a percentage of the mean flow, the second—the catchment area upstream of dams as a percentage of the total catchment area. These are important determinants of the habitat condition and aquatic biodiversity. Dams and percentage of the weirs disrupt longitudinal connectivity and fragment populations leading to watershed closed to decline in aquatic biodiversity. A high density of impoundments prevents biota from migrating to preferred structures habitats such as upstream spawning beds.
Percentage of watersheds close to movement of aquatic biota by anthropogenic structures	>100% 50-100% 20-50% 10-20% <10%	5 4 3 2 1	
Degree of flow fragmentation	0 0.001–0.01 0.01–0.1 3 0.1–1 >1	5 4 3 2 1	Naturally flowing river without artificial structures. With/out upstream storage reservoirs and with possibilities of movement upstream—like fish ladders—for aquatic fauna. With/out upstream storage reservoirs and with possibilities of movement upstream—like fish ladders—for aquatic fauna. With/out storage reservoirs with/out possibility for movement upstream for aquatic fauna only during monsoon. With/out storage reservoirs with/out possibility for movement upstream for aquatic fauna only during monsoon.
Percentage of exotic aquatic biota	0% <5% <10% <20% >20%	5 4 3 2 1	Successful invasion by exotic species often incurs losses and disruptions in ecosystem structures and functions (e.g., loss of biodiversity due to competitive exclusion and predation, disruption and modification of food webs, loss of habitat for fish and wildlife). Thus, the percentage of exotic species in a reach or a basin provides information on its likely sustainability and coping capacity.
Fish species relative richness	Very High High Moderate Minor None	5 4 3 2 1	The number of species that inhabit a watershed should be expressed as a percentage of the number that would be expected to occur there in the absence of human interventions. As a surrogate for the percentage of some 'natural' reference condition, the species richness may be quantified as a percentage of overall species in the country or geographical zone, or established by professional judgment.

Indicator	Range	Score	Justification
Human population in the entire river basin as a percentage of population density in the given area	<10% 10-20% 20-40% 40-60% >60%	1 2 3 4 5	Districts located primarily in floodplain in the entire river basin areas can be used to estimate population density in floodplains, other as a percentage of the districts - to estimate population density in the rest of the basin. It is assumed that population density in this measure may be seen as an aggregate indicator of human pressure on the main floodplains aquatic ecosystems and as an indicator of disruption of lateral connectivity in river basins.
Overall water quality in the basin	Class A Class B Class C Class D Class E	5 4 3 2 1	Water in Class A can be used for drinking after disinfection; water in class B is only for swimming and bathing; water in Class C requires conventional treatment and disinfection before drinking; water in Class D is suitable for propagation of wildlife and fisheries; and water in class E is only suitable for such uses as irrigation and industry cooling.

4.1.1. Fish diversity and spawning grounds

This is one of the richest sectors of entire Ganga River basin in terms of fish diversity and abundance in Uttarakhand. A total of 56 species of fishes, including 30 restricted range fishes, 16 threatened fishes and 2 endemic fishes (namely *Glyptothorax alaknandi* and *Glyptothorax garhwali*) are reported from this river sector (Rajvanshi *et al.* 2012). The threatened species of this basin are: *Tor putitora, Naziritor chilinoides r chelinoides, Schizothorax richardsonii, Bagarius bagarius, Garra gotyla, Garra lamda, Chagunius chagunio, Nemacheilus multifasciatus, Pseudecheneius sulcatus, Systomus arana, Puntius chola, Botia dario, Amblyceps mangois, Crossocheillus latius latius, Glyptothorax cavia* and *Glyptothorax telchitta*. In the entire stretch of River Ganga, this is the only sector which has viable population of golden mahseer *Tor putitora* (Rajvanshi *et al.,* 2012). Among the fishes, seven of them undergo breeding migration in this stretch, including the golden mahseer *Tor putitora* (Nautiyal *et al.,* 2008; Badola, 2009; Rajvanshi *et al.,* 2012). The detailed information on migratory species and their period of migration are presented in Table 2. These species migrate upstream and enter into small wadeable streams along the main Ganga for spawning. During the present study we observed young ones of golden mahseer (*Tor putitora*) and snow trout (*Schizothorax richardsonii*) in streams along the rivers. Based on this observation, three important fish spawning grounds were identified along the Ganga between Rishikesh and Kaudiyala. They are: Ghattu stream, Shivpruri stream and Gular stream (Figure 4). These fish breeding grounds should be free from any kind of human disturbance (camping at the confluence point of stream with river and along the stream banks). Since this is the only stretch of River Ganga that has viable population of golden

mahseer, it is recommended to document the migratory route, spawning ground and spawning period through radio-telemetry techniques, so that the necessary conservation measures can be taken up to conserve this endangered fish.

Table 2. List of migratory fish species reported from the study area*.

S.No.	Species	Type of migration	Area	Period
1.	*Tor putitora*	Long distance migrant	From lower Ganges migrate to Alaknanda Bhagirathi upstream & Nayar and other spring fed streams in lower Himalaya	July to Sept.
2.	*Labeo dyocheilus*	Long distance migrant	From lower Ganges migrate to Alaknanda	March to June
3.	*Labeo bata*	Long distance migrant	From lower Ganges migrate to Alaknanda Bhagirathi upstream & Nayar	-
4.	*Labeo dero*	Long distance migrant	From lower Ganges migrate to Alaknanda Bhagirathi upstream & Nayar	-
5.	*Raimamas bala*	Long distance migrant	From lower Ganges migrate to Alaknanda Bhagirathi upstream & Nayar	-
6.	*Naziritor chilinoides*	Local migrant	Migrate to Nayar	May to July & Dec. to January
7.	*Schizothorax richardsonii*	Local migrant	From lower Ganges migrate to Alaknanda Bhagirathi upstream & Nayar and small streams	Sept. to January

*based on Nautiyal *et al.,* 2008; Badola, 2008; Rajvanshi *et al.,* 2012.

Figure 4. Important golden mahseer spawning grounds along Ganga between Kaudiyala and Rishikesh.

4.1.2. River Health

Based on the existing information on fish species distribution record and ecological value of river habitat, the ecological condition of the river stretch between Kaudiyala and Rishikesh has been assessed as Environmental Management Class (EMC) 'C'. According to Smakhtin *et al.,* 2007 the EMC class the 'C' can be defined as:

"*The habitats and dynamics of the biota have been disturbed, but basic ecosystem functions are still intact. Some sensitive species are lost and/or reduced in extent. Alien species present"*

Similar assessments have been carried out in upper (downstream of Alaknanda and Bhagirathi) and lower reaches of Ganga (stretch between Rishikesh and Narora). The upstream sector just above Kaudiyala was assessed as EMC – 'C' class and Rishikesh to Narora was assessed as 'D' (Smakhtin *et al.,* 2007; Rajvanshi *et al.,* 2012).

4.2. Assessment of carrying capacity of beach camping

A team comprising, two scientists and six researchers from the WII, two field assistants and two local forest officials carried out a rapid field survey of the camping sites along the study area between 14 and 24 January 2016. The field team moved from upstream to downstream using rafts and surveyed an average distance of 5 km/day. At each camping location the team stopped and collected the following information: area of the beach, nature of beach, number of tents used, wild animal use along the beach camp area (based on sign surveys) and nature of riparian vegetation along the camping area (Figure 5). Apart from that river width from centre of the river to both banks were taken using a Range Finder at every 1 km from Kaudiyala to Rishikesh. Based on the field data, beach profile, ecological status of river, wildlife use and riparian quality matrix for each camping site were prepared. In addition to that the team also had interaction with local stakeholders in the field.

	
Measuring the river width	Assessing the riparian habitat quality
	
Recording the wild animal signs	Field inputs by the experts

Figure 5. Field activities related to assessing the ecological impacts of beach camping.

4.2.1. Mapping of river width and beach area

An intensive field survey was carried out along the study area and mapping of available beaches along the river Ganga. At each beach the following ground information were generated using a hand held GPS: location, beach boundary, marking of each camp site, coordinates of the toilets and kitchen. As shown in the figure 6, measurement of river width, beach width, beach to river bank distance at each camp site and distance to both banks from middle of the river at each beach was measured using a Range Finder (Figure 6).

Later, the geographical information collected in the field were transferred from GPS to work station using easy GPS and processed using ArcGIS. Quick World imagery available as inbuilt base map in ArcGIS was used as base line imagery for assessment and representation on maps. Using river path (that marks centre of river; collected during field survey) in ArcGIS, two different buffer zone of 50 and 100 meters respectively was created and plotted to understand overall ground situation along the river stretch.

Assessment of river width at every 1 km interval between Kaudiyala and Rishikesh reveals an average width of 88 m (bank to bank) of River Ganga. The maximum width of 170 m was observed at Laxman Jhula near Rishikesh. Thus, average width of the river from mid point comes to only 44m on either side. The river width recorded between the study area is presented in Figure 7. A total of 56 beaches were observed from Kaudiyala to Rishikesh and they were mapped (34 on the right bank along the Rishikesh-Srinagar road; 22 on the left bank). As per our observations 108 camps (including 7 camps in private land) were operational in the survey area (36 km stretch) before the ban came in to existence. Among 56 beaches, 3 small, sandy unused beaches were recorded, these beaches are highly dynamic not suitable for camping and other establishments. The information on each beach profile is given in fact sheets 1 to 56 (page no. 39-94).

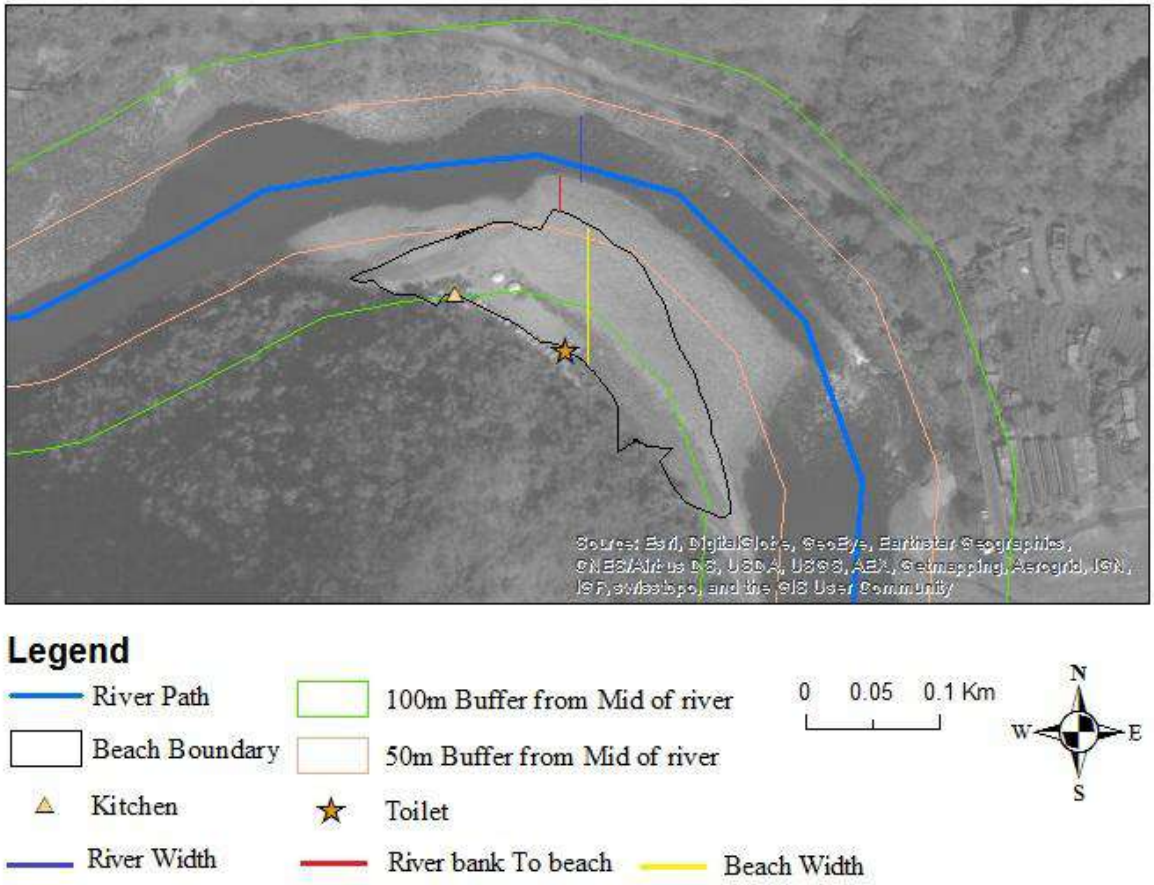

Figure 6. Geo-spatial parameters recorded for river beaches.

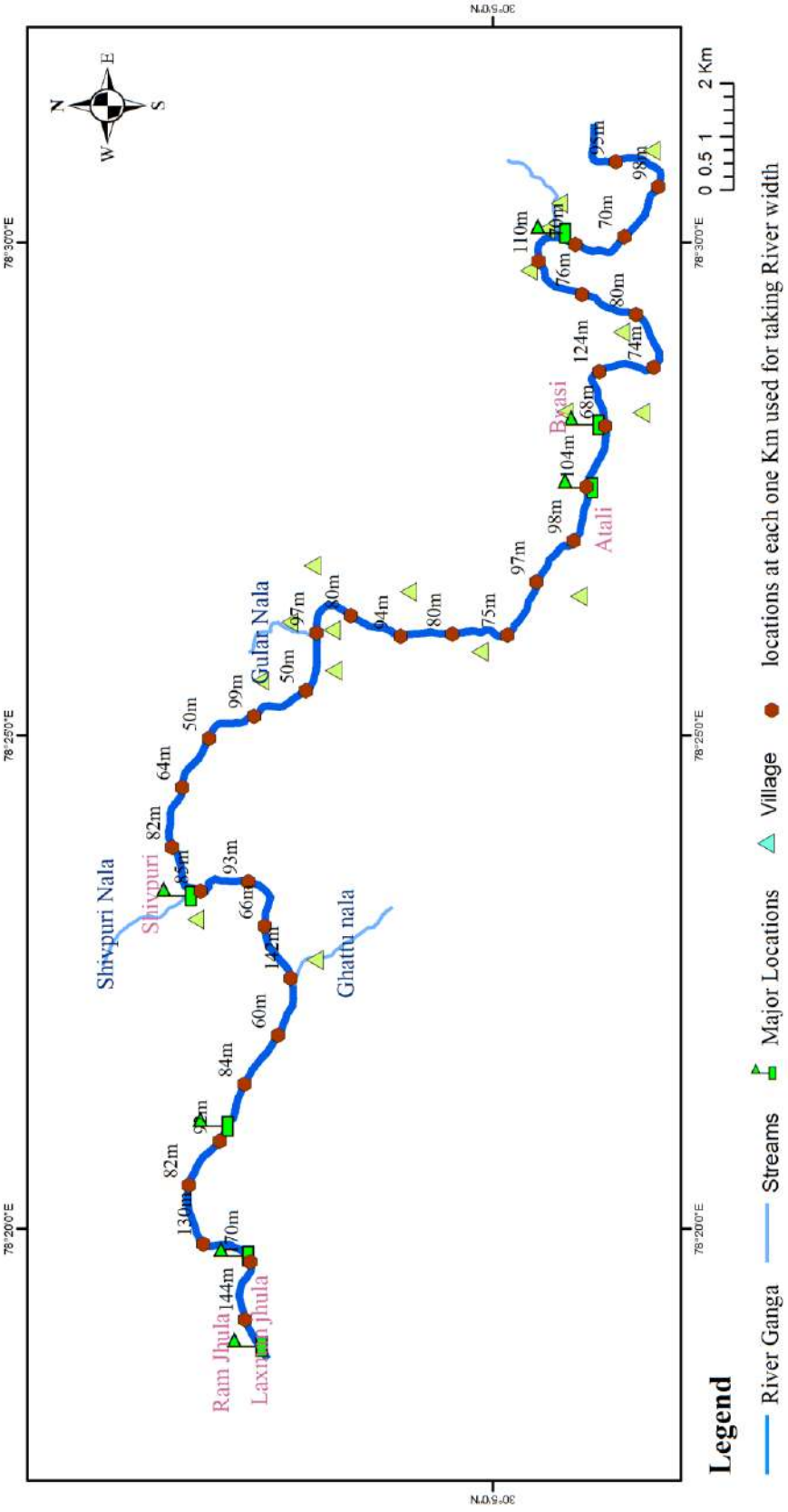

Figure 7. River width of Ganga between Kaudiyala and Rishikesh.

4.2.2. Wildlife Use Index

At each camping site, direct and indirect evidences of wild animals were recorded to quantify the habitat use by major species. As none of the beach camps were operational at the time of survey as per Hon'ble NGT Order, it provided better opportunity to pick up major wild animal signs along the beaches. Four sub-teams (two people in each) were formed for syst of animal signs such as pugmarks and scats of carnivores, hoof marks and pellets of wild ungulates, and other animal signs were recorded. In addition to the beaches, the adjoining riparian area was also explored for animal signs. Based on the search efforts, number of wild animal signs and the intensity of use, the following score patterns (Table 4) were adopted to evaluate Wildlife Use Index. Further, beaches with high intensity of animal signs were given additional 5 points to give higher weightage to the sites of high wildlife. Based on the summation of scores, beaches were classified into High (>10), Medium (5-10) and Low (<5) wildlife usage area.

Table 4. Score pattern used for calculating Wildlife Use Index.

Animal Species	Score	Rationale
Goral	5 points	As Gorals are habitat specialists, rare and highly sensitive to human disturbance, hence the access points to river beach for drinking water receive maximum point score.
Sambar deer	5 points	Sambar deer are habitat specialist, found along the undulating forest area. The presence of this deer indicates good health of the forests, hence maximum points were given.
Barking deer	3 points	Barking deer is a typical forest dwelling, solitary animal. Though it is rare, it can tolerate human disturbance. Hence it carries 3 point score.
Common leopard	2 points	Though common leopard is one of the endangered big cats, it can easily adapt to human disturbance. Hence it receives point 2 score.
Other wild animals (including Hyaena, Small cats, Porcupine etc.)	1 points	These species are quite common and co-exist in human dominated landscape. Hence they have been given 1 point score.

During the survey we came across direct and indirect evidences of several wildlife species viz., goral, barking deer, sambar, common leopard, hyaena, porcupine and small cats (Figure 8). Beach wise information on wild animals presence is given in *Appendix 4* and wildlife use scores are presented in Table 7. However, high intensity of wild animals especially common leopard recorded recorded in Beach no 7, 19 and 34. Goral and barking deers were sighted in beach no 13 & 48; 13, 18 & 35 respectively. Though, they are habitat specialist they cross

beach area for accessing water. The analysis of Wildlife Use Index shows that the beach no. 7, 13, 19, 37 and 48 (Table 7) are having rich wildlife around the area, hence these beaches should be made free of beach camping. In addition to that we found wild elephant foot prints in only one beach near Shivpuri (Beach no. 37). Based on the local information it was ascertained that very often elephant bulls visit this area especially during summer and this area also forms a connecting link between Rajaji Tiger Reserve and Narendra Nagar Forest Division. In order to avoid any human-elephant conflicts and to provide safe passage to elephants, beach no. 37 can be excluded from camping. Based on the Wildlife Use Index, the beach nos. 7, 13,19, 37 and 48 are assessed as high wildlife use area. Hence camping on these beaches should not be allowed.

Goral on the river beach

Barking deer on the river beach

Pugmark of leopard

Elephant foot print

Figure 8. Direct and indirect evidences of wild animals recorded in river beaches between Kaudiyala and Rishikesh during this study.

Apart from larger wild animals, many riverine birds were recorded along the beaches (Figure 9). During the present survey we recorded 27 species which include 9 river associated birds and 18 terrestrial birds. Among them one species (River Lapwing) has been assigned the threat category of Near Threatened (NT) as per IUCN Red Data Book.

Green tailed sunbird (*Aethopyga nipalensis*)

River Lapwing (*Vanellus duvaucelii*)

Wallcreeper (*Tichodroma muraria*)

Common Kingfisher (*Alcedo atthis*)

Indian Cormorant (*Phalacrocorax fuscicollis*)

Brown Dipper (*Cinclus pallasii*)

Figure 9. Bird species recorded during the field survey.

4.2.3. Riparian vegetation Vulnerability Index

The strip of vegetation that lies between terrestrial and aquatic interface is called riparian vegetation and it forms an integral part of the riverine ecosystem. The vegetation cover on the banks of river captures precipitation during monsoon and allows water to percolate into the soil through network of its root system. During summers, the vegetation along the drainage discharges the stored water through springs into the channels. Besides, the riparian vegetation provides variety of ecological services such as nutrient inputs into the flowing ecosystem, filters sediments and contaminates entering into the river and also provides habitat for many wild animals. The quality of riparian vegetation along the river bank can be expressed in terms of Riparian Vegetation Index (RVI). This Index is a site-based index that was developed to provide a condition index, which can be compared to indicate trends in the condition of riparian vegetation at each site over time (Kemper, 2001). The index values generated based on the riparian quality is directly related to condition of river habitat and quality. Hence, it can play an important role as a management tool. The index is based on four components of riparian habitat viz., Percentage of Riparian Cover (PRC), Structural Intactness of riparian species (SI), percentage of exotic weeds and terrestrial species and level of disturbance. It also takes into account differences in the geomorphology of the river from its headwaters to the lower reaches.

At each camping site, three 5 m radius circular plots were laid along the riparian strip and the following parameters were estimated: i) percentage of riparian cover, ii) structural intactness of tree, shrubs and grass species, iii)percentage of human disturbance, iv) percentage cover of weed, reed and exotic species and v) percentage of riparian species recruitment. These differences are measured in a simple, quantitative way by following formula:

Riparian Vegetation Index (RVI) = [(EVC) + ((SI x PCIRS) + (RIRS))]
EVC = Extent of Vegetation Cover
SI = Structural Intactness of Riparian species (Tree, Shrubs &Grasses)
PCIRS = Percentage Cover of Indigenous Riparian Species
RIRS = Recruitment Index of Riparian Species

EVC (score out of 10) = [(EVC 1 + EVC 2) / 2]
SI = [((SIl+SI2+SI3)/3) x 0.33]

PCIRS (score out of 5) = [(EVC / 2) - ((exotics x 0.7) + (terrestrial x 0.1) + (reeds x 0.2))]

The RIRS (score out of 5)

The index score varies between 0 and 20 points. Based on this index value, the conditions of beaches are assessed from A to E level as given in Table 5. Further,camping sites were clustered into small, medium, large and very large establishments depending upon the area of occupancy and number of tents used. The RVI index was calculated for all the camping areas as well as few undisturbed areas. At each site, minimum of three 5 m radius circular plots were laid to assess the condition of riparian vegetation. Based on the degree of disturbance score values in relation with natural habitat to different level of establishment, the carrying capacity was assessed.

Table 5. Riparian Vegetation Index (RVI) scores, corresponding class and river status.

RVI SCORE	ASSESSMENT CLASS	DESCRIPTION
19 - 20	**A**	Unmodified, natural.
17 -18	**B**	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.
13 -16	**C**	Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.
9 -12	**D**	Largely modified. A large loss of natural habitat , biota and basic ecosystem functions has occurred.
5-8	**E**	The loss of natural habitat, biota and basic ecosystem functions are extensive.
0-4	**F**	Modifications have reached a critical level and the system has been completely modified with almost complete loss of natural habitat and biota. In the worst case the basic ecosystem functions have been changed.

Based on RVI indices, the quality of riparian forests along the beaches were classified into High (Assessment Class A&B), Medium (Assessment Class C&D) and Low (Assessment Class E&F) quality of riparian forests.

Final RVI scores of each beach are presented in Table 7. As per the scores, no single beach qualifies as unaltered or pristine riparian forests. However, 8 beaches (Beaches 6, 16, 17, 22, 34, 36, 38 and 42) out of 56 have qualified as moderately disturbed area i.e., per quality class "Moderately modified". A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged. As the entire stretch of riparian vegetation between Kaudiyala and Rishikesh are modified due to various anthropogenic pressures from local people, such as lopping, cutting and livestock grazing, the real impact of camping activities could not be captured during the assessment.

4.2.4. Beach Vulnerability Index

Each camp was assessed in terms of its environmental sensitivity due to camping activities such as pitching of tents, use of river bank for recreation, noise, trespassing and disturbance to wildlife habitat. The camps located far away from human habitation and motor road, surrounded by pristine forests, and having a narrow beach (<10 – 15 m from the edge or within 50m from the middle of the river) were considered highly sensitive. On the other hand, camps located very close to human habitations and motor roads, having open beaches more than 100 m from the river, away from the forested habitats were considered less sensitive to degradation.

At each camp site we measured distance of the camp from the nearest human habitation, distance from the road, width of the river, distance to toilet sites from the bank of the river, width of the beach, total area of the camp and proportion of the forested habitat using boundary marked by GPS (Garmin Etrex 30) and Geo Eye Imagery (inbuilt as base map with ArcGIS). Using river path (that marks centre of river, collected during field survey), two different buffer zones of 50 and 100 meters respectively were created using ArcGIS and plotted to understand overall ground situation along the river stretch.

For each of these parameters vulnerability scores were assigned as follows:

1 = Low Vulnerability (less sensitive)

2 = Medium Vulnerability (moderately sensitive)

3 = High Vulnerability (highly sensitive).

Criteria for selecting various parameters for vulnerability assessment were as follows (based on Upadhyay and Jat, 2014)

1. **Distance to human habitation and road**: Several beaches and open banks in this stretch of the river are already disturbed due to anthropogenic activities such as human habitation and road. Considering that temporary beach camping adjacent to villages and roads may generate employment and may not affect wildlife use of the area, we have given low vulnerability scores to the camps close to human habitation and road. However, pristine nature of the riverine habitats and natural course of the river should be conserved for posterity. Hence a few potential camping sites which are located in the away from the human habitations have been considered for conservation and classified under highly sensitive sites. Hence this parameter has been included in the vulnerability assessment.

2. **Width of the beach:** Narrow beaches (<75m) are insufficient to provide space for pitching the tents, recreation and wildlife movement. Hence, such beaches have been considered more sensitive. On the other hand, wider beaches with sufficient space for pitching tents and recreation are recorded as less sensitive.

3. **Location and type of kitchen /toilet**: Kitchen and toilets generate a lot of garbage / waste which is likely to pollute the river as well as natural habitat. The dry toilets and kitchen located away from the river have less impacts on the area. However, permanent toilets close to river and beaches create high impact thereby making the camp site more vulnerable to degradation. As per the directives of the Hon'ble NGT, we have considered distance of toilets and kitchen from the middle of the river. However, width of the river as well as beach would be important consideration for future camping. Hence this parameter has been taken as an important criterion for vulnerability assessment.

4. **Proportion of the forested habitat used for camping**: Each camping area comprises a sandy beach, adjoining forested habitat, and rocky bank. Usually smaller beaches do not have adequate space for pitching tents and other recreational activities. Hence there is a tendency among camp owners to move into forested area for pitching tents and establish toilets and kitchen. Hence this parameter has been taken into consideration for assessing the vulnerability of forested habitat.

Methodology for assigning the vulnerability scores against various parameters are given in the following table (Table 6).

Table 6.Vulnerability Scores against various parameters.

Parameter	Measure	Vulnerability Score	Measure	Vulnerability Score	Measure	Vulnerability Score
Distance of camp from the roads	<50m	1	51 - 100m	2	>100m	3
Distance from human habitations	<250m	1	251 - 500m	2	>500m	3
Width of the beach	<75m	3	76 - 125m	2	>125m	1
Distance to toilet and kitchen from mid of the river	<50m	3 (Dry); 6 (Permanent)	51-100m	2 (Dry); 4 (Permanent)	>100m	1 (Dry); 2 (Permanent)
Proportion of camp under forested habitats	< 50%	1	51 - 75%	2	>75%	3

Cumulative Vulnerability Score: All the camp sites were assessed against above parameters as per Table 6. Cumulative scores of vulnerability were calculated by summing up the individual scores. The ranking of each camping site based on overall score were as follows:

- Highly sensitive camps (Highly vulnerable to degradation) = 12- 18
- Moderately sensitive (Moderately vulnerable to degradation) = 9.1 -11.9
- Less sensitive (Slightly vulnerable to degradation) = <9

The method used for data collection has been depicted in Figure 6.

The detailed vulnerability scores for individual parameters are given in *Appendix 5* and final scores are presented in Table 7. Out of 56 beaches studied, 8 beaches can be ranked areas highly vulnerable, and 21 as moderately vulnerable. Highly vulnerable beaches include Beach nos. 1, 2, 20, 33, 35, 43, 45 and 52. This implies that continued use of those camp sites year after year for pitching of tents and other activities would degrade the overall quality of riverine habitat and River Ganges would rapidly lose its original, pristine nature. Hence, highly vulnerable beaches (Beach nos. 1, 2, 20, 33, 35, 43, 45 and 52) are not recommended for camping.

Table 7. Final scores of Wildlife Use Index, Riparian Vegetation Index and Beach Vulnerability Index.

- High - Medium - Low

Beach No.	Camp names	Wildlife Use Index	Riparian Vegetation Index	Beach Vulnerability Index
1	Camp ganga riviera#	**0**	**6.78**	14
2	Geefive#	**0**	**7.31**	14
3	Real adventure group#	**7**	**7.79**	8
4	Star track#	**0**	**6.45**	8
5	Great northern Himalaya	**2**	**6.61**	10
6	Amazing ganga	**0**	**5.00**	6
7	GMVN+ Remo Expedition	**16**	**10.33**	8
8	Hide way	**0**	**6.45**	10
9	Adventure links	**2**	**7.54**	8
10	Sand piper	**3**	**7.54**	9
11	Kwestral + river view#	**0**	**8.95**	9
12	Eagle nest+Gold cost	**0**	**6.41**	10
13	Ganges music	**11**	**6.14**	9
14	Advent tour+Byasi Paryatan samiti+Red chilli	**2**	**7.54**	9.5
15	Alknanda	**2**	**8.07**	11

Beach No.	Camp names	Wildlife Use Index	Riparian Vegetation Index	Beach Vulnerability Index
16	J-2	**2**	**10.12**	8
17	Unused (unnamed)	**1**	**11.66**	6
18	River N Ranges+River wild	**6**	**7.24**	8
19	Sweet 16	**12**	**6.38**	10
20	Traveller zone	**4**	**8.66**	13
21	Adventure journey+Ripply adventure	**3**	**8.81**	10
22	Unused (unnamed)	**5**	**9.01**	9
23	Aquatera	**3**	**7.74**	10
24	VNA resort#+Real rafting adventure	**0**	**4.64**	11
25	Log out+Sunrise adventure	**3**	**8.17**	11
26	GHE camp*+Splash adventure*	**5**	**8.45**	9
27	North star adventure (Ganga Paradise)	**3**	**8.67**	9
28	Good morning tours+Rana venture+Himalayan Journey	**9**	**4.53**	8
29	Sea hawk+River rose	**3**	**4.37**	10
30	Gular ghati paryatan vikas samiti (Three blind mice)	**0**	**8.33**	10
31	Cross fire	**2**	**6.12**	9
32	Wonderlast travels	**2**	**8.77**	11
33	Green Ganga adventure	**2**	**8.44**	12.5
34	Garhwal Paryatan Vikas Samiti*+Alpine star	**8**	**9.30**	8
35	Great Himalaya Outdoor	**3**	**6.43**	14

Beach No.	Camp names	Wildlife Use Index	Riparian Vegetation Index	Beach Vulnerability Index
	(Butterfly adventure)			
36	Himalayan River Runner	**0**	**9.40**	9
37	Explore Himalayan Adventure+Bhandari camp+Unique Himalayan Adventure	**20**	**8.37**	11
38	Snow Leopard	**1**	**9.35**	9
39	Jungle adventure group*	**0**	**7.51**	7.5
40	16 companies(Himalaya river camp+Paradise+camp shivpuri+milky water+Ganga view+Spring bok+Sh.Dinesh Rakesh Pandey+Adventure Park+River Zone+PRD+Wave play adventure+Sh.Gobind Ram+Adventure Holiday+Indo Ganga Pvt. Ltd.+Sh.Gobind singh+Namami Resort)	**1**	**8.17**	9
41	12 companies(Indian Rafting Company+Paddler zone+Rapid action expedition+River side+River Himalayan adventure+Regal rafting+Hill side+Wave worn+River ranger+Sh.Jaipal+Shiv Ganga+Explore Himalayan expedition)	**0**	**6.33**	9
42	Sh. Umed Singh	**1**	**9.69**	8
43	Ganga river tour	**0**	**6.97**	12
44	Mercury Himalayan Exploration	**3**	**8.94**	9
45	River fun adventure	**0**	**8.03**	12

Beach No.	Camp names	Wildlife Use Index	Riparian Vegetation Index	Beach Vulnerability Index
46	Unused (unnamed)	**7**	**5.37**	8
47	Wonder & wild X	**2**	**8.31**	9
48	7 companies (zigzag adventure*+Ganga Holiday adventure* +Himalayan outfitter + ild expedition +splash adventure +adventure 3rd eye +Himalayan travel)	**11**	**5.43**	10
49	Garhwal adventure	**0**	**6.77**	10
50	Wildlife camp#+ Him river resort#	**5**	**6.21**	10.5
51	Great himalaya Outdoor adventure+Shree ganga adventure	**2**	**5.23**	7
52	Shiv ganga adventure	**2**	**5.04**	12.5
53	Garhwal Himalaya Exploration (Ganga nature camp)	**0**	**6.26**	11.5
54	Himgiri adventure	**0**	**6.01**	11
55	Dreamlife adventure+White bubble beach camp+Glacier tour adventure+ Outbond adventure+Himganga Adventure	**2**	**4.44**	11
56	Venture Himalayas+Amazing India	**5**	**6.00**	11

these are private camps *not found in official record.

In order to determine the vulnerability of beaches 4 attributes were considered viz., i). Fish spawning ground; ii). Wildlife rich area; iii). High Beach vulnerability and iv). Forests (100%) area used for camping. Table 8 presents the summation of the results. Out of 56 beaches, 14 beaches are found to be **'Highly Vulnerable'** on account of the four categories.

Table 8. Categorisation of beaches as per criteria of 'high vulnerability'.

Beach Number	Attribute	Recommendation
30, 43, 51	Fish spawning ground	Not recommended
7, 13, 19, 37, 48	High wildlife use	Not recommended
20, 33, 35, 43, 45, 52	High beach vulnerability	Not recommended
35, 52, 53, 54	High forest area utilization	Not recommended
17, 22, 46	Small unused beaches	Not suitable for camping because of space limitation & dynamic nature of beach formation
Total number of beaches not recommended for camping		**18 Beaches**

4.3. Assessment of carrying capacity of tents

Based on the field survey, total beach area available along the river stretch between Kaudiyala and Rishikesh was assessed. From the available beach area, the areas used by camping companies and % of forest area used in each beach was assessed. Further, based on the beach availability area, the carrying capacity of tents in each beach was evaluated as per the normative standards prescribed by the rafting union (*Appendix 6*). According to this, space requirement for each tent was estimated as 250 sq.m that include space for two bed accommodation, toilet, kitchen, dining space, supporting staff tents with toilet and bath and 80% of space for recreation environment.

The present study indicates that most of the companies have used more area than what was allotted by the Government (Table 9). Further, the companies that are using camping areas (beach no. 35, 52, 53 & 54) completely fall within forested area without any beach. The continuation of usage of these camps has also to be seen in the context of beach camping and also in respect of the provision of Forests Conservation Act, 1980.

As per the beach area mapping, the total area available in the 56 beaches for camping amounts to 464102 sq m. On the basis of Table 8 above, the net beach/camping area available in 38 out of 56 beaches/ camping sites is 341042.8 sq.m.

Hence the carrying capacity of tents = The net area of beach/ space requirement for single tent (250 sq.m)

341042.8 sq.m / 250 sq.m = 1364 tents

Therefore the carrying capacity of tents for available beaches is estimated as 1364 tents in river Ganga between Kaudiyala and Rishikesh.

Beach wise carrying capacity of tents is given in Table 9.

Table 9. Information on area allotted by government, area used by camping companies, area actually available on beaches and carrying capacity of tents.

Beach No	**Location**		**Total Beach area (sq. m)**	**Recommendation for camping (Y/N)**	**Beach area after recommendation**	**No of tents**	**Total beach camping area**	**Total No of tents**	**Remarks**
	Lat	**Long**							
1	30.0658	78.5162	1163	Yes	1163	5			Private
2	30.0635	78.5143	0	Yes	0	0			Private forest land
3	30.0567	78.5143	3807.7	Yes	3807.7	15			Private
4	30.055	78.5133	7688.6	Yes	7688.6	31			Private
5	30.0634	78.4996	3928.1	Yes	3928.1	16			
6	30.0724	78.5016	3454.8	Yes	3454.8	14			
7	30.0751	78.4994	18501.9	No	0	0			
8	30.0701	78.4914	1629.7	Yes	1629.7	7			
9	30.0657	78.4912	14656.6	Yes	14656.6	59			
10	30.0604	78.4886	8801.6	Yes	8801.6	35			
11	30.0579	78.486	10907.5	Yes	10907.5	44			
12	30.0576	78.4794	13254.5	Yes	13254.5	53			
13	30.0662	78.4739	4362.2	No	0	0			
14	30.065	78.4695	22487.1	Yes	22487.1	90			
15	30.0651	78.4642	4403.6	Yes	4403.6	18			
16	30.0673	78.4608	2990.0	Yes	2990.0	12			
17*	30.0675	78.4565	0	No	0	0		**1364**	Small beach – not suitable for camping
18	30.0699	78.4501	16172.8	Yes	16172.8	65			

Beach No	Location		Total Beach area (sq. m)	Recommendation for camping (Y/N)	Beach area after recommendation	No of tents	Total beach camping area	Total No of tents	Remarks
19	30.0727	78.4463	4562.0	No	0	0			
20	30.0756	78.4416	3837.2	No	0	0			
21	30.0769	78.4407	5088.7	Yes	5088.7	20			
22*	30.0773	78.4383	0	No	0	0			Small beach – not suitable for camping
23	30.0817	78.4337	16215.1	Yes	16215.1	65	**341042.8**		
24	30.085	78.4339	2039.2	Yes	2039.2	8			
25	30.0956	78.4344	701	Yes	701	3			
26	30.1025	78.4343	23087.3	Yes	23087.3	92			
27	30.1053	78.4365	3757.5	Yes	3757.5	15			
28	30.1097	78.4375	13410.0	Yes	13410.0	54			
29	30.1125	78.4361	14445.9	Yes	14445.9	58			
30	30.1136	78.4315	13751.0	No	0	0			
31	30.1219	78.4209	7322.5	Yes	7322.5	29			
32	30.127	78.4193	6962.2	Yes	6962.2	28			
33	30.1296	78.4178	5126.7	No	0	0			
34	30.1337	78.4129	16925.3	Yes	16925.3	68			
35	30.1362	78.4091	0	No	0	0			100% Forest area used
36	30.1363	78.4065	15860.2	Yes	15860.2	63			
37	30.1372	78.4	26206.3	No	0	0			
38	30.1383	78.4006	4395.2	Yes	4395.2	18			
39	30.1382	78.3981	3012.6	Yes	3012.6	12			
40	30.1367	78.3947	18982.1	Yes	18982.1	76			
41	30.135	78.3902	16474.1	Yes	16474.1	66			
42	30.1357	78.3885	3214.0	Yes	3214.0	13			

Beach No	Location		Total Beach area (sq. m)	Recommendation for camping (Y/N)	Beach area after recommendation	No of tents	Total beach camping area	Total No of tents	Remarks
43	30.1327	78.3899	5750.3	No	0	0			
44	30.1318	78.3917	4213.2	Yes	4213.2	17			
45	30.1297	78.3917	1469.3	No	0	0			
46*	30.1203	78.3887	0	No	0	0			Small beach – not suitable for camping
47	30.1217	78.388	5342.8	Yes	5342.8	21			
48	30.1211	78.3824	31401.8	No	0	0			
49	30.1184	78.3773	3209.5	Yes	3209.5	13			
50	30.1155	78.3777	22198.9	Yes	22198.9	89			Private
51	30.1166	78.3743	8792	No	0	0			
52	30.1175	78.3723	0	No	0	0			100% Forest area used
53	30.1208	78.3649	0	No	0	0			100% Forest area used
54	30.1217	78.3635	0	No	0	0			100% Forest area used
55	30.1269	78.355	14152.1	Yes	14152.1	57			
56	30.1344	78.3335	4687.8	Yes	4687.8	19			

*unused small beaches not suitable for camp establishment because of space limitation.

4.4. Other observations

In the present study, it has been noted that most of the camps have not followed the norms and guidelines prescribed by the regulatory authorities, which includes: no proper waste and garbage disposable mechanism, use of permanent toilets and septic tank pipes (luxury toilets on the beach) and sewerage drainage pipes etc. The followings are the some of the pictures taken during the present study.

No proper garbage management system

Sewage pipe draining out to beach

Sewage pipe directly draining in to Ganga (from a private resort)

Permanent toilet structure

Permanent toilet structure

5.0. Recommendations

1. On the basis of a rapid assessment of the beach camping operations carried out along the River Ganga between Kaudiyala and Rishikesh in the context of their impacts on river ecosystem, the characterization of the total 56 beach camping sites is given in Table 9.

Table 9. Information on area allotted by government, area used by camping companies, area actually available on beaches and carrying capacity of tents.

Beach No	Location		Total Beach area (sq. m)	Recommendation for camping (Y/N)	Beach area after recommendation	No of tents	Total beach camping area	Total No of tents	Remarks
	Lat	**Long**							
1	30.0658	78.5162	1163	Yes	1163	5			Private
2	30.0635	78.5143	0	Yes	0	0			Private forest land
3	30.0567	78.5143	3807.7	Yes	3807.7	15			Private
4	30.055	78.5133	7688.6	Yes	7688.6	31			Private
5	30.0634	78.4996	3928.1	Yes	3928.1	16			
6	30.0724	78.5016	3454.8	Yes	3454.8	14			
7	30.0751	78.4994	18501.9	No	0	0			
8	30.0701	78.4914	1629.7	Yes	1629.7	7			
9	30.0657	78.4912	14656.6	Yes	14656.6	59			
10	30.0604	78.4886	8801.6	Yes	8801.6	35			
11	30.0579	78.486	10907.5	Yes	10907.5	44			
12	30.0576	78.4794	13254.5	Yes	13254.5	53			
13	30.0662	78.4739	4362.2	No	0	0			
14	30.065	78.4695	22487.1	Yes	22487.1	90			
15	30.0651	78.4642	4403.6	Yes	4403.6	18			
16	30.0673	78.4608	2990.0	Yes	2990.0	12			
17*	30.0675	78.4565	0	No	0	0		**1364**	Small beach – not suitable for camping
18	30.0699	78.4501	16172.8	Yes	16172.8	65			

Beach No	Location		Total Beach area (sq. m)	Recommendation for camping (Y/N)	Beach area after recommendation	No of tents	Total beach camping area	Total No of tents	Remarks
19	30.0727	78.4463	4562.0	No	0	0			
20	30.0756	78.4416	3837.2	No	0	0			
21	30.0769	78.4407	5088.7	Yes	5088.7	20			
22*	30.0773	78.4383	0	No	0	0			Small beach – not suitable for camping
23	30.0817	78.4337	16215.1	Yes	16215.1	65	**341042.8**		
24	30.085	78.4339	2039.2	Yes	2039.2	8			
25	30.0956	78.4344	701	Yes	701	3			
26	30.1025	78.4343	23087.3	Yes	23087.3	92			
27	30.1053	78.4365	3757.5	Yes	3757.5	15			
28	30.1097	78.4375	13410.0	Yes	13410.0	54			
29	30.1125	78.4361	14445.9	Yes	14445.9	58			
30	30.1136	78.4315	13751.0	No	0	0			
31	30.1219	78.4209	7322.5	Yes	7322.5	29			
32	30.127	78.4193	6962.2	Yes	6962.2	28			
33	30.1296	78.4178	5126.7	No	0	0			
34	30.1337	78.4129	16925.3	Yes	16925.3	68			
35	30.1362	78.4091	0	No	0	0			100% Forest area used
36	30.1363	78.4065	15860.2	Yes	15860.2	63			
37	30.1372	78.4	26206.3	No	0	0			
38	30.1383	78.4006	4395.2	Yes	4395.2	18			
39	30.1382	78.3981	3012.6	Yes	3012.6	12			
40	30.1367	78.3947	18982.1	Yes	18982.1	76			
41	30.135	78.3902	16474.1	Yes	16474.1	66			
42	30.1357	78.3885	3214.0	Yes	3214.0	13			

Beach No	Location		Total Beach area (sq. m)	Recommendation for camping (Y/N)	Beach area after recommendation	No of tents	Total beach camping area	Total No of tents	Remarks
43	30.1327	78.3899	5750.3	No	0	0			
44	30.1318	78.3917	4213.2	Yes	4213.2	17			
45	30.1297	78.3917	1469.3	No	0	0			
46*	30.1203	78.3887	0	No	0	0			Small beach – not suitable for camping
47	30.1217	78.388	5342.8	Yes	5342.8	21			
48	30.1211	78.3824	31401.8	No	0	0			
49	30.1184	78.3773	3209.5	Yes	3209.5	13			
50	30.1155	78.3777	22198.9	Yes	22198.9	89			Private
51	30.1166	78.3743	8792	No	0	0			
52	30.1175	78.3723	0	No	0	0			100% Forest area used
53	30.1208	78.3649	0	No	0	0			100% Forest area used
54	30.1217	78.3635	0	No	0	0			100% Forest area used
55	30.1269	78.355	14152.1	Yes	14152.1	57			
56	30.1344	78.3335	4687.8	Yes	4687.8	19			

*unused small beaches not suitable for camp establishment because of space limitation.

2. In the context of 'vulnerability' with respect to impacts of beach camping operations, the following beaches/camping areas have been determined as "highly vulnerable" and therefore "not recommended" for beach camping operations.

Beach Number	Attribute	Recommendation
30, 43, 51	Fish spawning ground	Not recommended
7, 13, 19, 37, 48	High wildlife use	Not recommended
20, 33, 35, 43, 45, 52	High beach vulnerability	Not recommended
35, 52, 53, 54	High forest area utilization	Not recommended
17, 22, 46	Small unused beaches	Not suitable for camping because of space limitation & dynamic nature of beach formation
Total number of beaches not recommended for camping		**18 Beaches**

3. The total area available in the 56 beaches for camping amounts to 464102 sq.m. On the basis of para 2 above, the net beach/camping area available in 38 out of 56 beaches/camping sites is 341042.8 sq.m

4. On the basis of normative standards used for determining space requirement for a tent i.e 250 sq. m., the total number of tents that can be pitched in 38 beaches are 341042.8/250 = 1364 tents.

5. Beach numbers 3, 6, 9, 24 and 55 which are located near hanging bridges that have been constructed to provide access to local people/villagers, should be allowed to continue as beach camping sites as in these areas access and human use has to be given precedence.

6. It has been observed that the 'Guidelines for regulating river rafting operations' issued by Government of Uttar Pradesh dated 25 September 1999 (*Appendix 7*) have not been followed in 'letter and spirit'. It is recommended that Government of Uttarakhand may revisit these guidelines and re-issue them in order to promote as well as regulate the rafting industry in such a manner that ecological values of the mountain/river/forest and wildlife ecosystems are maintained in perpetuity.

7. A "Management Plan" for the "Rafting Beach Camps and their Operations" may be prepared to ensure sustainability of the operations.

8. Use of permanent structures especially toilets and kitchens in the beach camps may be totally banned to prevent river pollution.

9. Given the topography of the mountainous terrain, camping within 100m from the middle of the river, if regulatory regime is strictly followed, would not harm the environment.

10. A multi-institutional monitoring committee comprising of representatives of the Revenue, Forest, Tourism departments including representatives the Uttarakhand State Pollution Control Board, professional rafting associations, scientific institutions/university may be constituted to ensure compliance of "Do's" and "Don'ts" for operating the rafting operations and monitoring of ecological and economic parameters.

11. A mechanism for using trained and certified rafting instructors/guides may be institutionalized for promoting both safety and positive experience of rafting activities.

12. Since the river stretch is used for (a) rafting (b) rafting and camping and (c) picnicking, a system of 'Voluntary Beach Policing' especially during the rafting season may be established to deal with any violations and rescue operations, if required.

13. It is recommended that up to 4 raft pick-up and dropping points currently being used from the Reserved Forests may be allowed which should be regularly monitored. These points are:
    i. Kaudiyala: N 30^{o}, 04'31.4"; E 78^{o}, 30' 03.2"
    ii. Marine Drive: N 30^{o},05'21.64"; E 78^{o}, 26' 4.76"
    iii. Shivpuri: N 30^{o}, 08' 2.6"; E 78^{o}, 23' 25.8"
    iv. Brahmpuri: N 30^{o}, 07' 15.3" ; E 78^{o}, 21' 54"

14. The fact sheet on 56 camp sites appended to this report may be used for planning, management and monitoring of the river rafting operations.

15. The number of registered rafts allowed in the survey area as in 2014 seem to be sustainable. However, at a time not more than 1000 rafts should be allowed in this area.

16. A review of river rafting operations/activities may be carried out every five year by a competent technical agency.

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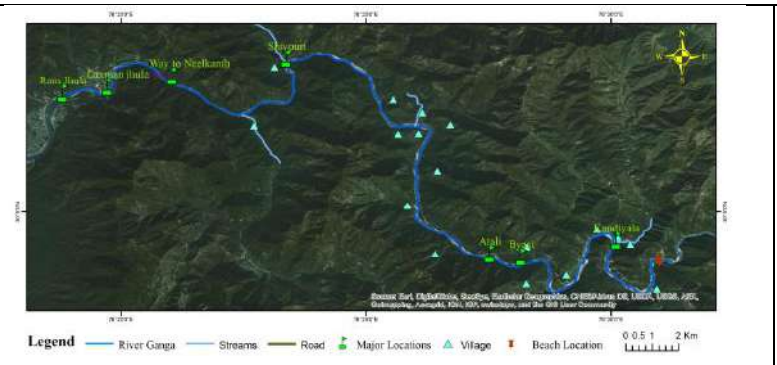
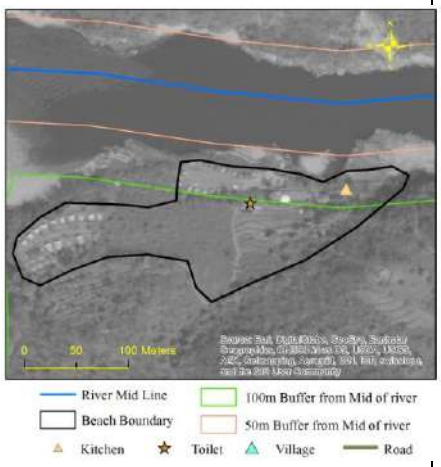
Beach no. 1





Beach Profile:

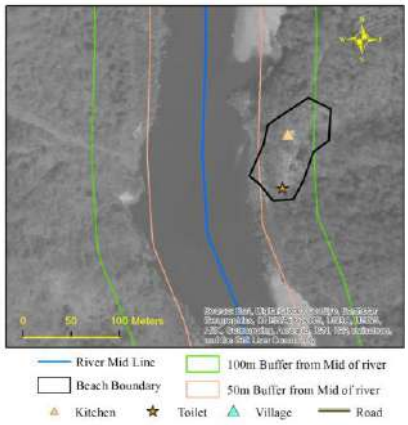
Location	78.5162 E	30.0658 N	Nature of Beach	Forest	
Length & Width of Beach	L-340m W-40m to 80m		River Width	140 to 150m	
Bank to Beach distance	20m (height >20m)		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right	Left	Area	23256 sq m	
	70	130 and 165	Site	Left Bank	
Legal status of land	Private		Distance from Neighbouring Beach	Upstream: Start Point Downstream: 615m	
Number of companies	Single				
No. of tents	34		Beach Vul. Score	14	

Wildlife use: During the field survey no direct or indirect signs of wildlife species was observed.

Riparian quality: The Riparian vegetation index for this beach falls under the category low (6) indicating heavily degraded riparian vegetation as most of it has been cleared to make the permanent construction.

Observations: Permanent toilets were found at a distance of the 100m from the midpoint of the river.

Beach no. 2



Beach Profile:

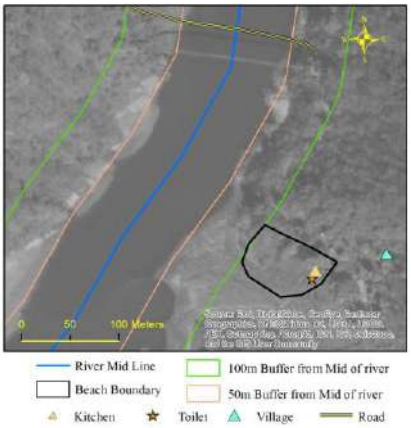
Location	78.5143 E	30.0635 N	Nature of Beach	Forest	
Length & Width of Beach	L-110m W- 35m		River Width	110m	
Bank to Beach distance	20m (height >20m)		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right	Left	Area	4593 sq m	
	55m	110m	Site	Left bank	
Legal status of land	Private		Distance from Neighbouring Beach	Upstream: 615m Downstream: 662m	
Number of companies	Single				
No. of tents	Not Available		Beach Vul. Score	14	

Wildlife use: During the field survey no direct or indirect sign of wildlife species was found. There were signs of domestic livestock, e.g. goat pellets; cattle-dung. Direct sighting of rhesus macaque were noticed.

Riparian quality: The Riparian vegetation index for this beach was low (7) showing the loss of natural habitat extensively in the form of clearance of vegetation area for pitching tents for kitchen and toilets.

Observations: Toilet was found in between the range of 50m-100m from midpoint of the river. Outlet pipe of toilets were seen going inside the river.

Beach no. 3



Beach Profile:

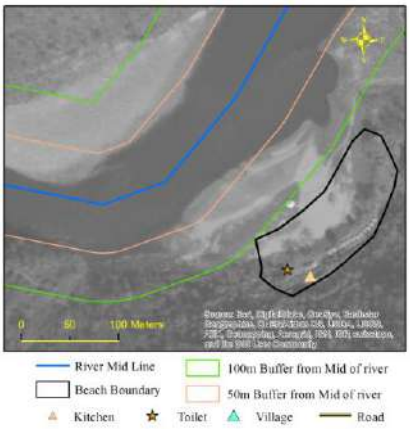
Location	78.5143 E	30.0567 N	Nature of Beach	10% Sand	90% Stone
Length & Width of Beach	L-53m W-58m		River Width	110	
Bank to Beach distance	30m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right	Left	Area	3807 sq m	
	65m	143m	Site	Left bank	
Legal status of land	Private		Distance from Neighbouring Beach	Upstream: 662m Downstream: 262m	
Number of companies	Single				
No. of tents	20		Beach Vul. Score	8	

Wildlife use: During the field survey no direct signs of any wildlife species was recorded but there were plenty of indirect signs of leopard (scats and pugmarks). This area also heavily used by domestic livestock.

Riparian quality: The Riparian vegetation index for this beach is low (7) showing the loss of natural habitat extensively. Most part of the vegetation is cleared and permanent toilets have been constructed.

Observations: Permanent toilet was found beyond 100m distance from midpoint of the river.

Beach no. 4



Beach Profile:

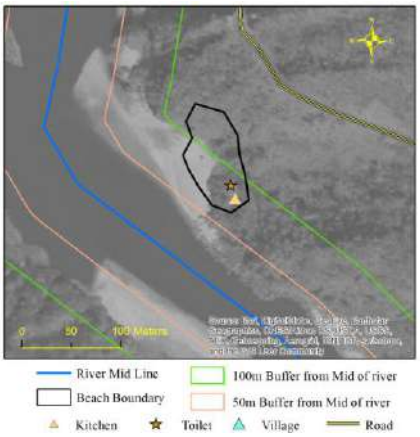
Location	78.5133 E	30.055 N	Nature of Beach	60% Sand	30% forest
Length & Width of Beach	L-165m W-65m		River Width	220m	
Bank to Beach distance	5m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right	Left	Area	10292 Sq m	
	120m	180m	Site	Left bank	
Legal status of land	Private		Distance from Neighbouring Beach	Upstream: 262m Downstream: 1690m	
Number of companies	Single				
No. of tents	26		Beach Vul. Score	8	

Wildlife use: During the field survey no direct or indirect sign of wildlife species was recorded. There were only signs of livestock grazing, also recorded goat pellets and cattle dung.

Riparian quality: The Riparian vegetation index for this beach was low (6). A small part of the riparian forest has been cleared for pitching tents and constructing permanent toilets.

Observations: Permanent toilets were found at a distance of 100m from midpoint of the river.

Beach no. 5



Beach Profile:

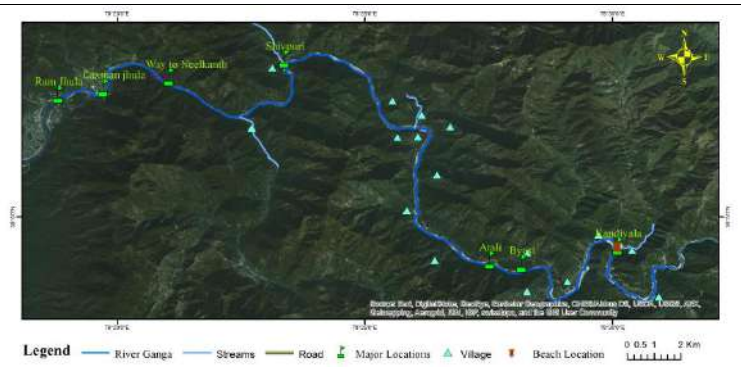
Location	78.4996 E	30.0634 N	Nature of Beach	80% Sand	20% Stone
Length & Width of Beach	L-120m W-40 m		River Width	130m	
Bank to Beach distance	12m		Toilet Type	Dry Pit Type	
Either side bank distance from mid of river	Right	Left	Area	4145	
	107m	65	Site	Right Bank	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 1690m Downstream: 1080m	
Number of companies	Single				
No. of tents	21		Beach Vul. Score	10	

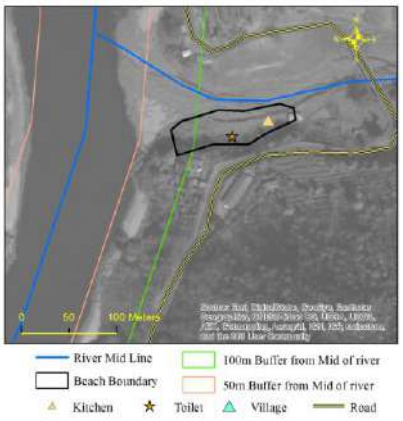
Wildlife use: During the field survey no direct sign of any wildlife species was recorded but we found indirect signs of leopard in the form of pugmark and scat. There were direct sightings of rhesus macaque.

Riparian quality: The Riparian vegetation index for this beach was low (6). Small area of vegetation has been cleared for kitchen and toilets with few lopped trees.

Observations: Dry pit toilet was found in the range of 50m-100m from midpoint of the river.

Beach no. 6





Beach Profile:

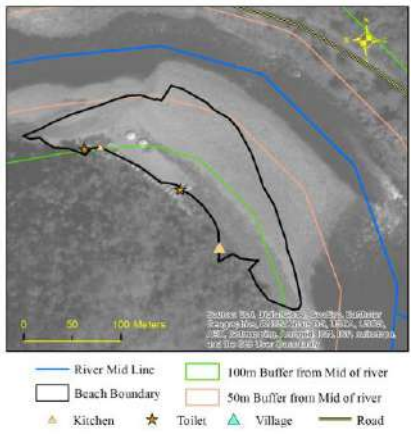
Location	78.5016 E	30.0724 N	Nature of Beach	20% Sand	80% stone
Length & Width of Beach	L-35m W-80m		River Width	100m	
Bank to Beach distance	30m		Toilet Type	Permanent Structures	
Either side bank distance from mid of river	Right	Left	Area	3455 sq m	
	160m	85m	Site	Right	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 1080m Downstream: 383m	
Number of companies	Single				
No. of tents	13		Beach Vul. Score	6	

Wildlife use: During the field survey there were no direct or indirect signs of wildlife species. Signs of domestic livestock viz. goat pellets and cattle-dung were recorded.

Riparian quality: The Riparian vegetation index for this camp was low (5) showing the loss of natural habitat extensively. This beach was having the permanent toilets with few lopped trees.

Observations: Permanent toilets were found beyond 100m distance from midpoint of the river but very close to stream within 50m distance.

Beach no. 7



Beach Profile:

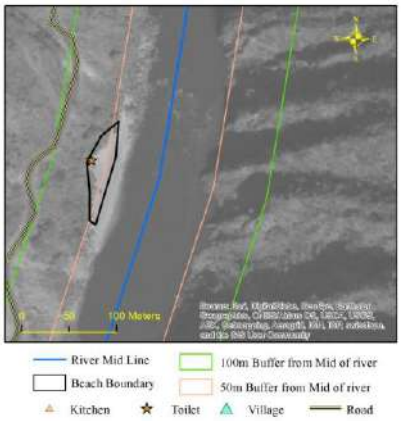
Location	78.4994 E	30.0751 N	Nature of Beach	10% Sand	90% Stone
Length & Width of Beach	L-321m W-65m		River Width	70	
Bank to Beach distance	15m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right	Left	Area	18501	
	55	115	Site	Left	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 383m Downstream: 1154m	
Number of companies	Two				
No. of tents	10		Beach Vul. Score	8	

Wildlife use: During the field survey, there were no direct signs of any wildlife species but we found indirect signs of leopard with cubs, hoof marks and pellets of barking deer, pellets of goral, and porcupine tracks.

Riparian quality: The Riparian vegetation index for this beach was medium having score value 10 indicating moderate loss of natural vegetation. There were no lopping signs.

Observations: There were manmade platforms for tenting due to rocky nature of campsite. Toilets were found at two different places one within the range of 100m and other beyond 100m from midpoint of the river.

Beach no. 8



Beach Profile:

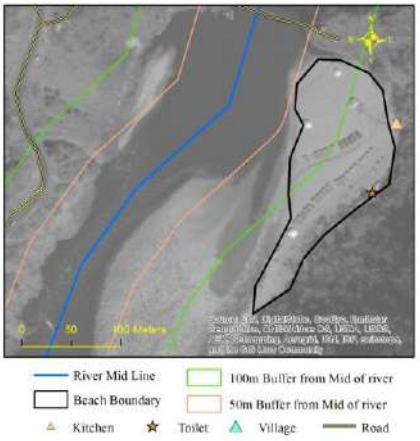
Location	78.4914 E	30.0701 N	Nature of Beach	20% Sand	80% Stone
Length & Width of Beach	L-103m, W-20m		River Width	80	
Bank to Beach distance	5		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right	Left	Area	1629	
	65	45	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 1154m Downstream: 429m	
Number of companies	Single				
No. of tents	8-10		Beach Vul. Score	10	

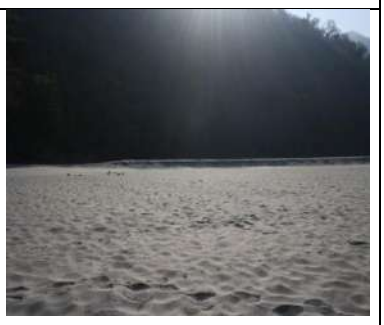
Wildlife use: During the field survey of this beach there were no direct or indirect signs of wildlife species. There were only indirect signs of langur.

Riparian quality: The Riparian vegetation index for this beach was low (6) showing the loss of natural habitat extensively in the form of two trails and less lopped trees.

Observations: Beach formation varies. Dry pit toilet was found within 50m range from midpoint of the river.

Beach no. 9





Beach Profile:

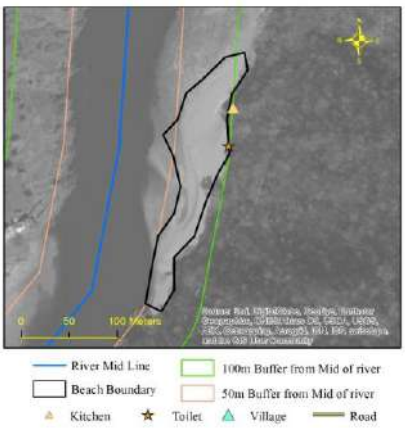
Location	78.4912 E	30.0657 N	Nature of Beach	90% Sand	10% Stone
Length & Width of Beach	L-260,W-70m		River Width	110	
Bank to Beach distance	20m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right	Left	Area	14657 sq m	
	95	145	Site	Left	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 429m Downstream: 696m	
Number of companies	Single				
No. of tents	30		Beach Vul. Score	8	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found fresh and old pugmarks of a small cat and tracks of porcupine. Signs of cattle grazing were plenty.

Riparian quality: The Riparian vegetation index for this beach was low (7) showing the loss of natural vegetation and lopping. Two big trails found were used by the villagers.

Observations: Permanent toilet was found beyond the 100m range from midpoint of the river.

Beach no. 10



Beach Profile:

Location	78.4886 E	30.0604 N	Nature of Beach	90% Sand	10% Stone
Length & Width of Beach	L-270m, W-40m		River Width	68	
Bank to Beach distance	45m		Toilet Type	Dry pit	
Either side bank distance from mid of river	Right	Left	Area	8801 sq m	
	34	129	Site	Left	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 696m Downstream: 416m	
Number of companies	Single				
No. of tents	22		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found pugmarks and scats of leopard and fresh pugmarks of a small cat.

Riparian quality: The Riparian vegetation index for this beach was low (7) showing the loss of natural vegetation. Toilets were found inside the riparian vegetation on clearing it.

Observations: Dry pit toilet was found at a distance of 100m from midpoint of the river.

Beach no. 11

Beach Profile:

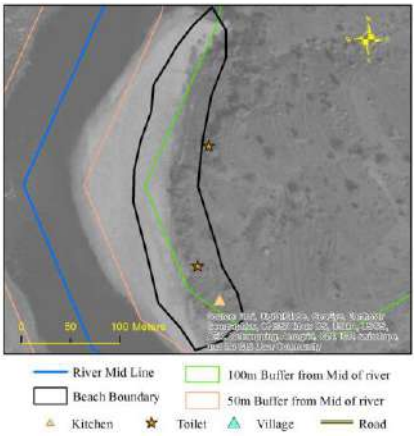
Location	78.486 E	30.0579 N	Nature of Beach	15 % Sand	85 % Stone
Length & Width of Beach	L-312m, W-50m		River Width	55	
Bank to Beach distance	40		Toilet Type	Dry pit	
Either side bank distance from mid of river	Right	Left	Area	11977 sq m	
	118	30	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 416m Downstream 960m	
Number of companies	Two				
No. of tents	52		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were only direct sighting of rhesus macaque close to the camp.

Riparian quality: The Riparian vegetation index for this camp was low (8) showing the loss of natural vegetation. Two major trails by villages were seen. Toilets were found inside the vegetation area with lopping signs.

Observations: Dry pit toilet found within the range of 100m from midpoint of the river.

Beach no. 12



Beach Profile:

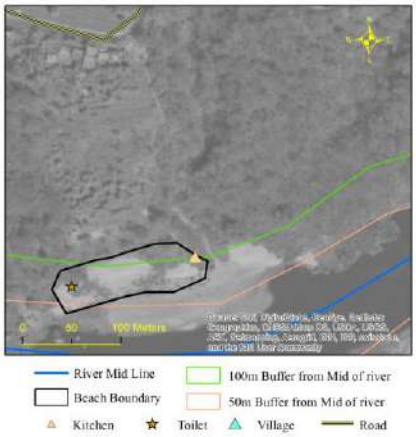
Location	78.4794 E	30.0576 N	Nature of Beach	65% sand	35% Forest
Length & Width of Beach	L-329m,W-60m		River Width	100	
Bank to Beach distance	40m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right	Left	Area	18412 sq m	
	150	50	Site	Right	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 960m Downstream: 1407m	
Number of companies	Two				
No. of tents	54		Beach Vul. Score	10	

Wildlife use: During the field survey of this beach there were no direct or indirect signs of any wildlife species.

Riparian quality: The Riparian vegetation index for this beach was low (6) showing the loss of natural vegetation which has been cleared for making toilets.

Observations: Heap of garbage was found from disuse or vandalism. Metal wastes such as machine parts along with bottles and plastic was found. Two toilets were found beyond the 100m range from midpoint of the river inside the forest.

Beach no. 13



Beach Profile:

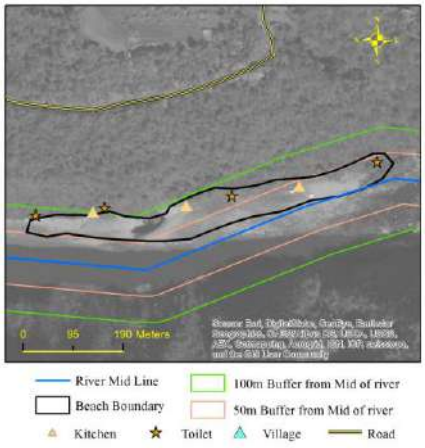
Location	78.4739 E	30.0662 N	Nature of Beach	60% Sand	40% Stone
Length & Width of Beach	L-133m,W-60 m		River Width	100m	
Bank to Beach distance	50 m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right	Left	Area	5691 sq. m	
	160 m	500m	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 1407m Downstream: 441m	
Number of companies	Single				
No. of tents	23		Beach Vul. Score	9	

Wildlife use: During the field survey there were direct sighting of two gorals and a barking deer close to Reserved Forest. Indirect signs of leopard (pugmark), tracks of porcupine and langur were recorded.

Riparian quality: The Riparian vegetation index for this beach was low (6) showing the loss of natural forest with a few lopping signs.

Observations: Dry pit toilet were found within the range of 50m to 100m from midpoint of the river.

Beach no. 14



Beach Profile:

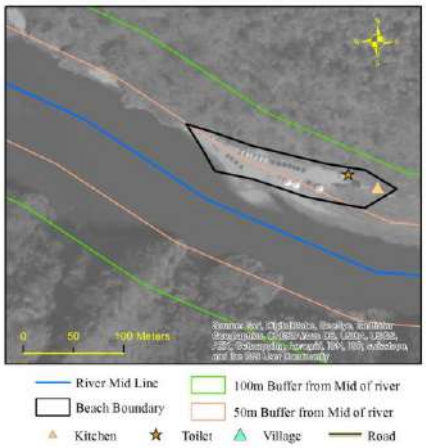
Location	78.4695 E	30.065 N	Nature of Beach	40% Sand	50% Stone
Length & Width of Beach	L-611m,W-50m		River Width	75	
Bank to Beach distance	20		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right	Left	Area	31624 Sq. m	
	102	38	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 441m Downstream: 596m	
Number of companies	Three				
No. of tents	54		Beach Vul. Score	9.5	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz. scat and pugmark of leopard and droppings of langur and rhesus macaque.

Riparian quality: The Riparian vegetation index for this beach was low (7) showing the loss of natural habitat extensively in the form of many lopped trees and toilets inside the forest.

Observations: This camping site has been raised using the rocks. Among 4 toilets set up, one was within 50m and other three were within 100m range from midpoint of the river.

Beach no. 15



Beach Profile:

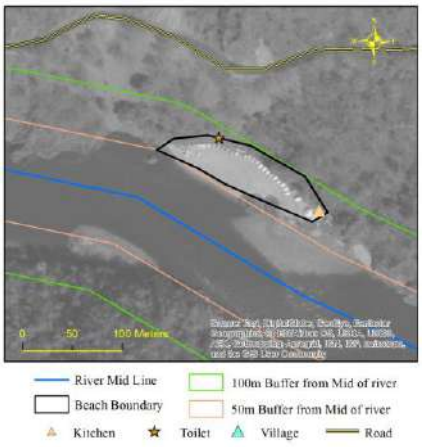
Location	78.4642 E	30.0651 N	Nature of Beach	60% Sand	40% Stone
Length & Width of Beach	L-169m,W-40m		River Width	70	
Bank to Beach distance	28		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right	Left	Area	5675 Sq. m	
	103	40	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 569m Downstream: 460m	
Number of companies	Single				
No. of tents	33		Beach Vul. Score	11	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs of leopard (pugmark).

Riparian quality: The Riparian vegetation index for this beach was low (8) showing the loss of natural habitat extensively with few lopped trees.

Observations: Dry toilet found within the 100m from midpoint of the river.

Beach no. 16



Beach Profile:

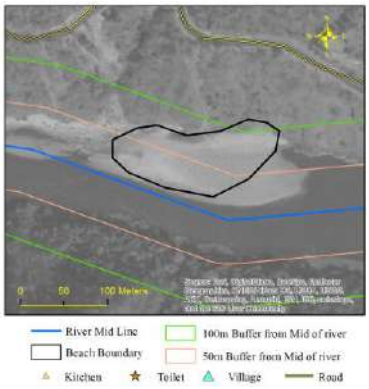
Location	78.4608 E	30.0673 N	Nature of Beach	85% Sand	5% Stone
Length & Width of Beach	L-149m,W-50m		River Width	90	
Bank to Beach distance	20		Toilet Type	Dry pit	
Either side bank distance from mid of river	Right	Left	Area	5298 Sq. m	
	115	45	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 460m Downstream: 358m	
Number of companies	Single				
No. of tents	19		Beach Vul. Score	8	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs such as fresh and old pugmarks of leopard and trail of a python.

Riparian quality: The Riparian vegetation index for this beach comes under medium category (10) showing the loss of natural habitat in the form of garbage at camping site and many lopped trees.

Observations: Dry toilets were found within 50m to 100m from midpoint of the river.

Beach no. 17



Beach Profile:

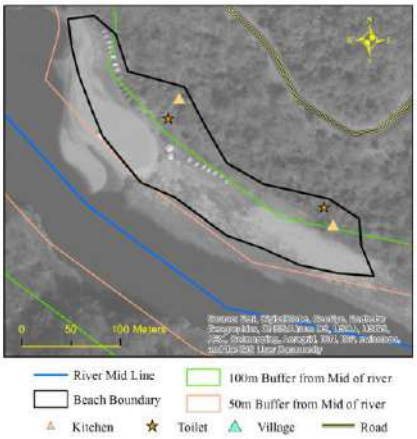
Location	78.4565 E	30.0675 N	Nature of Beach	90% Sand	10% Stone
Length & Width of Beach	L-155m,W-30m		River Width	110	
Bank to Beach distance	5		Toilet Type	NA	
Either side bank distance from mid of river	Right	Left	Area	9873 Sq. m	
	90	65	Site	Right	
Legal status of land	NA		Distance from Neighbouring Beach	Upstream: 358m Downstream: 714m	
Number of companies	NA				
No. of tents	NA		Beach Vul. Score	6	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found old pugmark of a small cat and pellets of goat.

Riparian quality: This beach is predominantly natural as no tents are pitched on this beach. The Riparian vegetation index value was medium (11) which shows some loss and change of habitat but predominantly unchanged. This beach is found to have good signs of regeneration trees.

Observations: Observed sewage directly coming into the river.

Beach no. 18



Beach Profile:

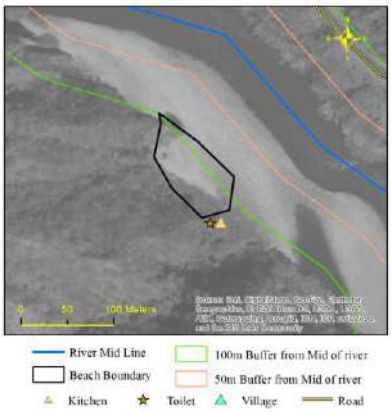
Location	78.4501 E	30.0699 N	Nature of Beach	50% Sand	30% Forest
Length & Width of Beach	L-345m,W-45m		River Width	95	
Bank to Beach distance	20		Toilet Type	Dry pit	
Either side bank distance from mid of river	Right	Left	Area	22038 sq. m	
	112	48	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 714m Downstream: 531m	
Number of companies	Two				
No. of tents	47		Beach Vul. Score	8	

Wildlife use: During the field survey of this beach there was direct sighting of a barking deer and indirect signs viz. pugmark of leopard and a small cat.

Riparian quality: The Riparian vegetation index for this beach was low (7) showing the loss of natural habitat extensively. The shrubs and grasses of this beach had been cleared to pitch the tent and establish the toilets. 3 trees had been lopped. There were 2 main trails leading to the main road.

Observations: Both the toilets were found beyond 100m from midpoint of the river.

Beach no. 19



Beach Profile:

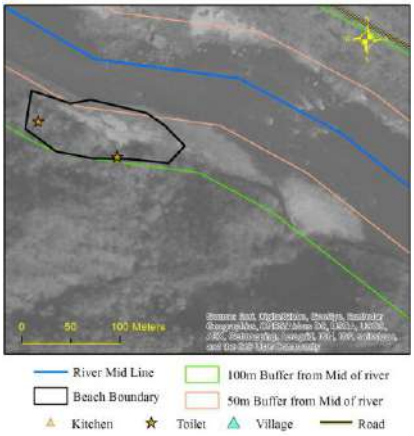
Location	78.4463 E	30.0727 N	Nature of Beach	40% Sand	60 % Stone
Length & Width of Beach	L-104m,W-31 m		River Width	87	
Bank to Beach distance	50 m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right	Left	Area	4562 sq. m	
	44 m	124 m	Site	Left Bank	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 531m Downstream: 610m	
Number of companies	Single				
No. of tents	27		Beach Vul. Score	10	

Wildlife use: During the field survey of this beach we found no direct signs of any wildlife species but there were signs viz. fresh and old pugmark of leopard, hoof marks and pellets of goral. The entire beach area was full of pugmarks of leopard.

Riparian quality: The Riparian vegetation index of this beach was low (6) indicating the loss of natural habitat. Lopped tress were seen along with garbage in the form of broken tents. Vegetation had been cleared to make the toilet area.

Observations: Toilets were inside forested area beyond 100m from midpoint of the river.

Beach no. 20



Beach Profile:

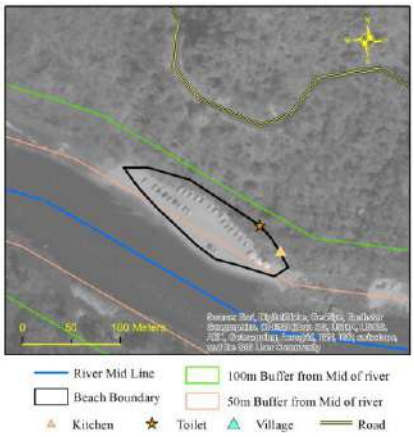
Location	78.4416 E	30.0756 N	Nature of Beach	80% Sand	20% stone
Length & Width of Beach	L-138m,W-55 m		River Width	70	
Bank to Beach distance	10 m		Toilet Type	Permanent structure	
Either side bank distance from mid of river	Right	Left	Area	6528 sq. m	
	95	100	Site	Left Bank	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 610m Downstream: 135m	
Number of companies	Single				
No. of tents	13		Beach Vul. Score	13	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs of leopard (fresh pugmark) and tracks of small cat and porcupine.

Riparian quality: The Riparian vegetation index of this beach was low (8) which shows the loss of natural habitat and less number of lopped trees.

Observations: Two permanent toilets were found within the range of 100m from midpoint of the river.

Beach no. 21



Beach Profile:

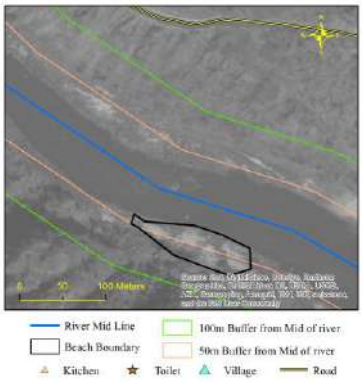
Location	78.4407 E	30.0769 N	Nature of Beach	90% sand	10% stone
Length & Width of Beach	L-157m,W-30 m		River Width	98	
Bank to Beach distance	5 m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right	Left	Area	6391 sq. m	
	84 m	69 m	Site	Right Bank	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 135m Downstream: 218m	
Number of companies	Two				
No. of tents	23		Beach Vul. Score	10	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs such as pugmarks of hyena and leopard.

Riparian quality: The Riparian vegetation index for this beach was low (8) which shows the loss of natural vegetation including more number of lopped trees including a trail to reach the road.

Observations: Dry pit toilet found in the range of 50m to 100m from midpoint of the river.

Beach no. 22



Beach Profile:

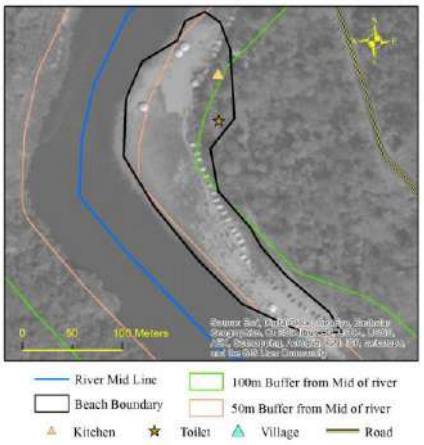
Location	78.4383 E	30.0773 N	Nature of Beach	40% Sand	60% Stone
Length & Width of Beach	L-120m,W-30m		River Width	90	
Bank to Beach distance	10		Toilet Type	NA	
Either side bank distance from mid of river	Right	Left	Area	4007 sq. m	
	65	85	Site	Left	
Legal status of land	NA		Distance from Neighbouring Beach	Upstream: 218m Downstream: 711m	
Number of companies	NA				
No. of tents	NA		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs i.e. old pugmarks of leopard and pellets of barking deer.

Riparian quality: The Riparian vegetation index of this beach was medium (9) which shows less modification of the habitat. This beach also includes the landslide from the sides.

Observations: This beach was undisturbed and not used for camping activities.

Beach no. 23



Beach Profile:

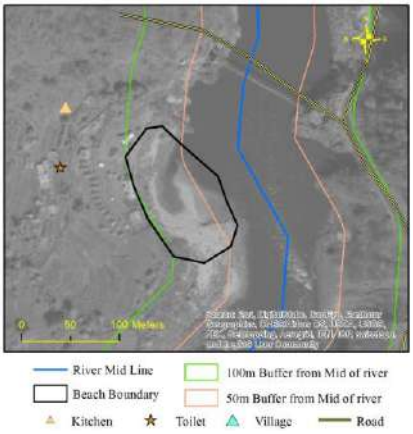
Location	78.4337 E	30.0817 N	Nature of Beach	60% Sand	40% stone
Length & Width of Beach	L-366m,W-45 m		River Width	85	
Bank to Beach distance	5 m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right	Left	Area	21646 sq. m	
	93 m	42 m	Site	Right Bank	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 711m Downstream: 426m	
Number of companies	Single				
No. of tents	24		Beach Vul. Score	10	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz. pugmarks of hyena and leopard

Riparian quality: This beach located at right bank of the river Ganga falls in the category low of Riparian vegetation index with a score value of 7. A part of the riparian vegetation is cleared to make the toilets and trail has been established that leads to main road.

Observations: Extra area (1610 sq m) available with similar characteristics but not in use. Toilet found beyond the 100m range from midpoint of the river inside forest.

Beach no. 24



Beach Profile:

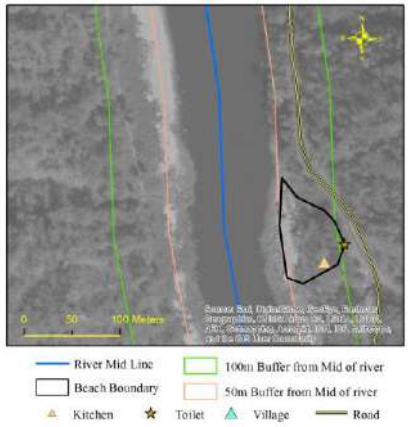
Location	78.4339 E	30.085 N	Nature of Beach	95% Sand	5% Stone
Length & Width of Beach	L-140m,W-50 m		River Width	90m	
Bank to Beach distance	8 m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right	Left	Area	8418 sq. m	
	45	103	Site	Left Bank	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 426m Downstream: 1158m	
Number of companies	Single				
No. of tents	13		Beach Vul. Score	11	

Wildlife use: During the field survey of this beach there were no direct or indirect signs of wildlife species.

Riparian quality: The riparian vegetation index of this beach was low (4) indicating complete loss of natural habitat.

Observations: Kitchen and toilets were established on private land. Beach was being used for a cricket tournament.

Beach no. 25



Beach Profile:

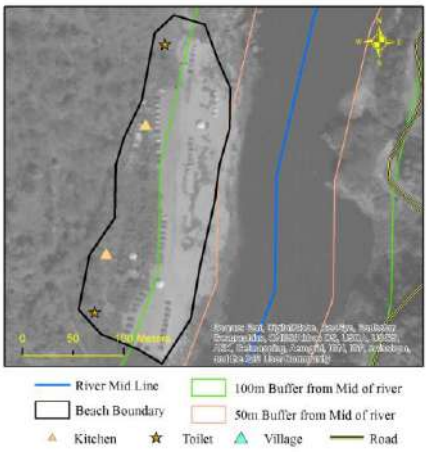
Location	78.4344 E	30.0956 N	Nature of Beach	20% Sand	80% Stone
Length & Width of Beach	L-85m,W-50 m		River Width	70 m	
Bank to Beach distance	15 m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right	Left	Area	3969 sq. m	
	100	70 m	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 1158m Downstream: 813m	
Number of companies	Two				
No. of tents	11		Beach Vul. Score	11	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz. pugmarks of leopard and tracks of porcupine.

Riparian quality: The riparian vegetation index of this beach was low (8) indicating loss of natural habitat. It is very near to the road and entire vegetation has been cleared for pitching tents along and toilets.

Observations: Area available for camping is fragmented due to broken terrain. Reduced area for camping due to stones with toilet inside the forest at edge of the 100m range from midpoint of the river.

Beach no. 26



Beach Profile:

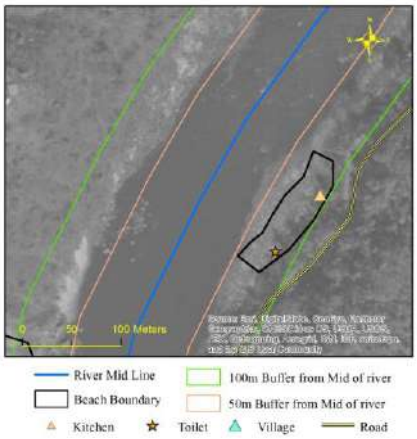
Location	78.4343 E	30.1025 N	Nature of Beach	55% sand	30% Forest
Length & Width of Beach	L-328m,W-68 m		River Width	116	
Bank to Beach distance	10 m		Toilet Type	Dry pit	
Either side bank distance from mid of river	Right	Left	Area	26045 sq. m	
	58 m	136 m	Site	Left Bank	
Legal status of land	Not in list		Distance from Neighbouring Beach	Upstream: 813m Downstream: 342m	
Number of companies	Two				
No. of tents	81		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz. pugmark of hyena, leopard and small cat; tracks of porcupine. There was direct sighting of group of langur near to beach area. There were also signs of livestock grazing for e.g. goat pellets and cattle-dung.

Riparian quality: The riparian vegetation index of this beach was low (8) indicating loss of natural habitat. Riparian vegetation area had been cleared to make kitchen and toilets with lopping of trees.

Observations: Two toilet have been set ups beyond the 100m range from midpoint of the river.

Beach no. 27



Beach Profile:

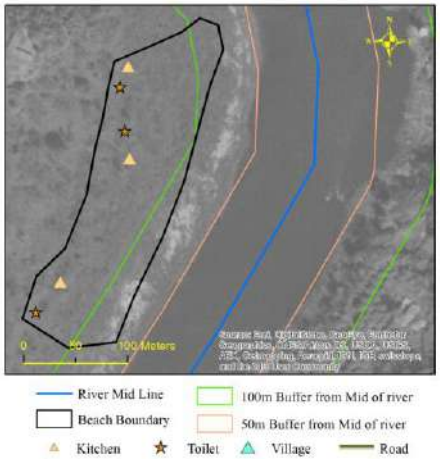
Location	78.4365 E	30.1053 N	Nature of Beach	50% Sand	50% Stone
Length & Width of Beach	L-127m,W-40 m		River Width	98	
Bank to Beach distance	15 m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right	Left	Area	3758 sq. m	
	99 m	59 m	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 342m Downstream:549 m	
Number of companies	Single				
No. of tents	NA		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz. pugmarks of hyena and leopard close to the road.

Riparian quality: The Riparian vegetation index of this beach was low (8) showing loss of natural habitat.

Observations: Toilet found within the range of 50m to 100m from midpoint of the river.

Beach no. 28



Beach Profile:

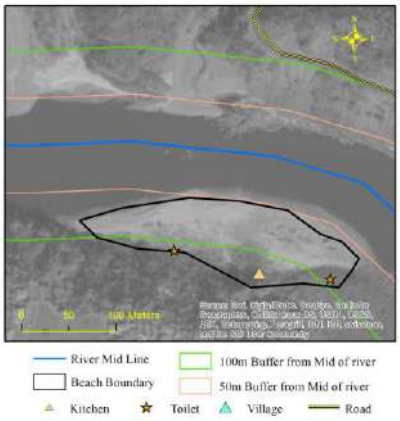
Location	78.4375 E	30.1097 N	Nature of Beach	40% Sand	40% forest
Length & Width of Beach	L-308m,W-50 m		River Width	106 m	
Bank to Beach distance	35 m		Toilet Type	Both	
Either side bank distance from mid of river	Right	Left	Area	23937 sq. m	
	60 m	138 m	Site	Left bank	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 549m Downstream: 460m	
Number of companies	Two				
No. of tents	65		Beach Vul. Score	8	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz. pugmarks and scat of leopard, fresh pellets of goral and pugmarks of small cat and hyena.

Riparian quality: The Riparian vegetation index of this beach was low (4) indicating loss of natural habitat. Vegetation is cleared to pitch the tents.

Observations: Camping area extended by clearing a portion of forest with 3 toilets setup beyond the 100m range from midpoint of the river inside the forest.

Beach no. 29



Beach Profile:

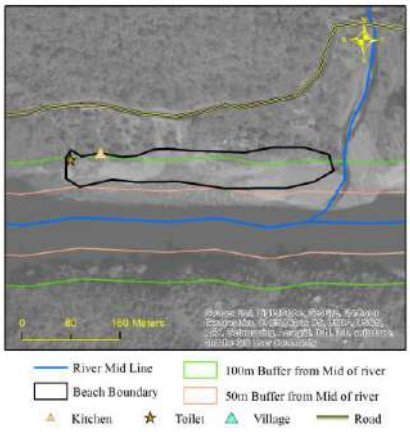
Location	78.4361 E	30.1125 N	Nature of Beach	60% Sand	30% Stone
Length & Width of Beach	L-247m,W-56 m		River Width	86	
Bank to Beach distance	10 m		Toilet Type	Permanent	
Either side bank distance from mid of river	Right	Left	Area	14445 sq. m	
	53 m	109 m	Site	Left Bank	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 460m Downstream: 504m	
Number of companies	Two				
No. of tents	19		Beach Vul. Score	10	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz. scat of leopard and fresh pugmark of a small cat.

Riparian quality: The Riparian vegetation index of this beach was low (4) showing complete loss of natural vegetation and habitat. Toilets found inside the riparian vegetation with some part of its clearance.

Observations: Sand and boulder mining in the river bed was noticed. Between two toilets setup, one was within the range of 100m from midpoint of the river and other beyond 100m range.

Beach no. 30



Beach Profile:

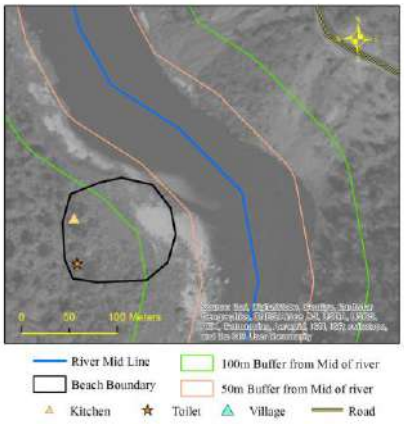
Location	78.4315 E	30.1136 N	Nature of Beach	60% sand	40% stone
Length & Width of Beach	L-375m,W-45 m		River Width	110 m	
Bank to Beach distance	25 m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right	Left	Area	20064 sq. m	
	125m	45 m	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 504m Downstream:1658m	
Number of companies	Single				
No. of tents	23		Beach Vul. Score	10	

Wildlife use: During the field survey of this beach there were no direct or indirect signs of any wildlife species.

Riparian quality: The Riparian vegetation index of this beach was low (8) indicating loss of natural habitat. All the shrubs and grasses were removed for making toilets with some lopped trees. Outlet pipes were seen coming directly from the toilet to the main river.

Observations: Extra area (4225 sq. m) present which has not been used for camping. Toilet was established in the range of 100m from the mid of the river.

Beach no. 31



Beach Profile:

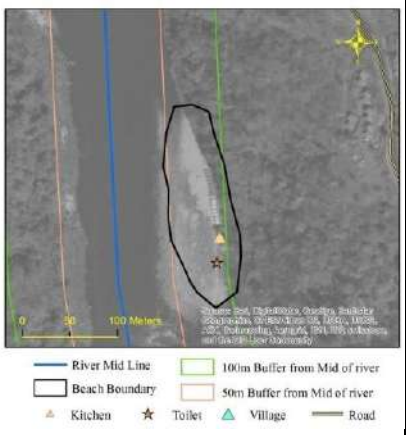
Location	78.4209 E	30.1219 N	Nature of Beach	40% Sand	30% Stone
Length & Width of Beach	L-105m,W-82		River Width	110 m	
Bank to Beach distance	5		Toilet Type	Permanent structure	
Either side bank distance from mid of river	Right	Left	Area	9211 Sq. m	
	65	142	Site	Left	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 1658m Downstream: 586m	
Number of companies	Single				
No. of tents	36		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were direct sighting of group of langur and a few indirect signs viz. old pugmark of a leopard.

Riparian quality: The riparian vegetation index for this site was low (6) indicating loss of natural habitat extensively. Riparian vegetation was cleared to make the kitchen inside it.

Observations: Toilet found beyond the 100m range from midpoint of the river.

Beach no. 32



Beach Profile:

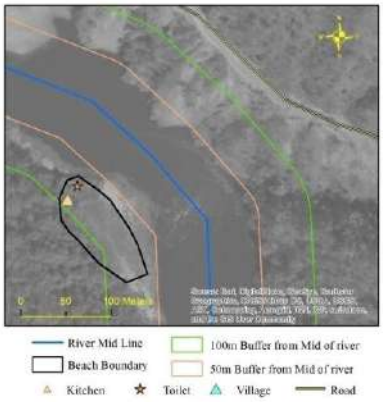
Location	78.4193 E	30.127 N	Nature of Beach	25% Sand	55% Stone
Length & Width of Beach	L-205m,W-34 m		River Width	83 m	
Bank to Beach distance	7		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right	Left	Area	10337.17 Sq. m	
	82 m	42 m	Site	Right	
Legal status of land	Forests		Distance from Neighbouring Beach	Upstream: 586m Downstream: 360m	
Number of companies	Single				
No. of tents	22		Beach Vul. Score	11	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz. fresh and old pugmarks of leopard.

Riparian quality: The riparian vegetation index of this beach was low (8) which shows loss of natural habitat having a lot of disturbances in the form of lopping and clearance of vegetation area setting up of kitchen and toilets.

Observations: Toilet found in the range of 50m to 100m from midpoint of the river.

Beach no. 33



Beach Profile:

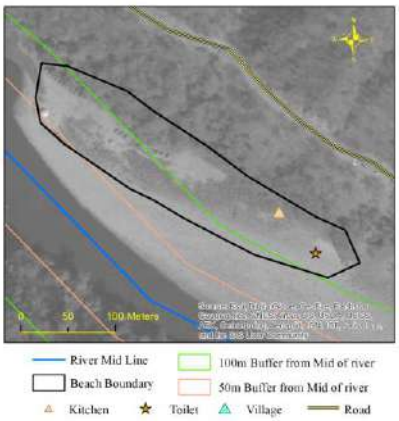
Location	78.4178 E	30.1296 N	Nature of Beach	20% Sand	70% Stone
Length & Width of Beach	L-126m,W-45m		River Width	110	
Bank to Beach distance	5		Toilet Type	Permanent structure	
Either side bank distance from mid of river	Right:	Left:	Area	5127 sq. m	
	55	105	Site	Left	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 360m Downstream:710 m	
Number of companies	Single				
No. of tents	25		Beach Vul. Score	12.5	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz., old pugmark of leopard.

Riparian quality: The riparian vegetation index of this beach was low (8) indicating the loss of natural habitat in the form of lopping and clearance to make kitchen. Toilet pit was very close to the river.

Observations: Platform has been raised for pitching the tents. Modified river bank structure. Toilet found in the range of 50m to 100m from mid of the river.

Beach no. 34



Beach Profile:

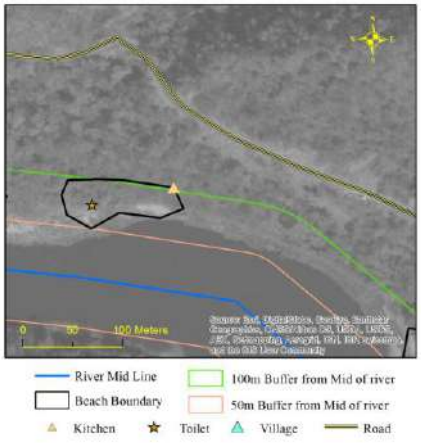
Location	78.4129 E	30.1337 N	Nature of Beach	30% Sand	50% stone
Length & Width of Beach	L-339m,W-40 m to 55m		River Width	64 m to70m	
Bank to Beach distance	50 m to 75m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right:	Left:	Area	23292 sq. m	
	160m	35m	Site	Right	
Legal status of land	Forests		Distance from Neighbouring Beach	Upstream: 710m Downstream: 425m	
Number of companies	Two				
No. of tents	42		Beach Vul. Score	8	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz., fresh and old pugmarks of leopard and hyena. The intensity of leopard use was high at this beach. Also there were signs of livestock grazing.

Riparian quality: The riparian vegetation index of this beach was medium (9) indicating modification of natural habitat. Shrubs and grasses were removed from the forest for making kitchen and trees had been lopped.

Observations: Camping sites had been artificially raised /modified. Toilets were found beyond 100m from midpoint of the river.

Beach no. 35



Beach Profile:

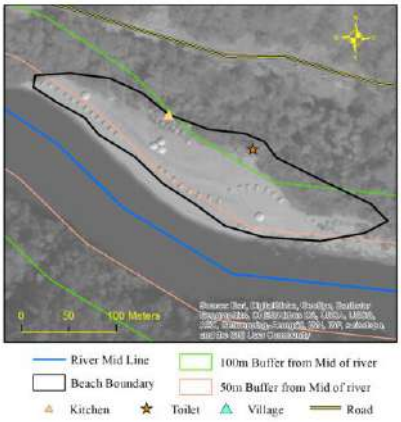
Location	78.4091 E	30.1362 N	Nature of Beach	40% stone	30% Forest
Length & Width of Beach	L-100m,W-30m		River Width	130	
Bank to Beach distance	5-10m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right:	Left:	Area	3616 sq. m	
	105 m	75m	Site	Right	
Legal status of land	Forests		Distance from Neighbouring Beach	Upstream: 425m Downstream: 272m	
Number of companies	Single				
No. of tents	NA		Beach Vul. Score	14	

Wildlife use: During the field survey of this beach there was direct sighting of a barking deer. There were no other indirect signs.

Riparian quality: The riparian vegetation index for this beach was low (6) indicating extensive loss of natural habitat. Vegetation area cleared for setting kitchen inside. Lopping of trees was observed.

Observations: Toilets found in the range of 50m to 100m from midpoint of the river.

Beach no. 36



Beach Profile:

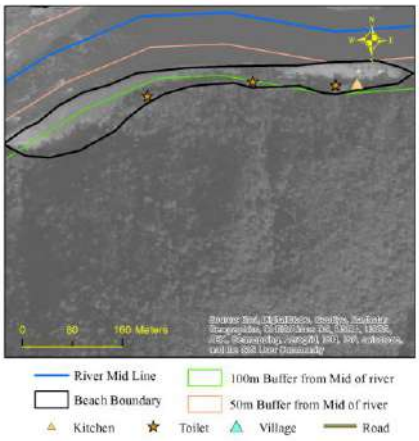
Location	78.4065 E	30.1363 N	Nature of Beach	80% Sand	20% forest
Length & Width of Beach	L-335m,W-65m		River Width	90	
Bank to Beach distance	15		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right:	Left:	Area	21089 sq. m	
	125m	45m	Site	Right Bank	
Legal status of land	Forests		Distance from Neighbouring Beach	Upstream: 272m Downstream: 620m	
Number of companies	Single				
No. of tents	57		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were no direct or indirect signs of wildlife species. There were signs of livestock grazing goat pellets and cattle-dung.

Riparian quality: The riparian vegetation index for this beach was medium (9) which shows modification of the natural habitat. For kitchen and toilets, the vegetation area was cleared including the lopping of trees with a trail up to the road.

Observations: High human interference with a toilet beyond 100m from midpoint of the river.

Beach no. 37



Beach Profile:

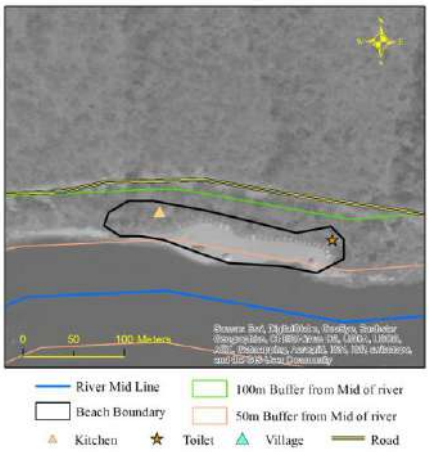
Location	78.4 E	30.1372 N	Nature of Beach	30% sand	60% stone
Length & Width of Beach	L-572m,W-30m to 50m		River Width	80 m	
Bank to Beach distance	10m to20m		Toilet Type	Permanent structure	
Either side bank distance from mid of river	Right:	Left:	Area	26206 sq. m	
	40-80 m	90-110	Site	Left bank	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 620m Downstream: 73m	
Number of companies	Three				
No. of tents	56		Beach Vul. Score	11	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz., fresh and old pugmarks; of leopard; Hoof mark of barking deer and Sambar. We also found the dung and fresh footprint of elephant; fresh and old pellets of barking deer and goral. There were also signs of livestock grazing animals viz., goat pellets and cattle dung. This area is heavily used by the wildlife species.

Riparian quality: The riparian vegetation index for this beach was low (8) indicating the extensive loss of natural habitat with disturbance in the form of clearance of riparian vegetation for pitching the tents and above riparian area vegetation was cleared to make kitchen and toilets by removing ground vegetation.

Observations: Three toilet setups found from which two were in the range of 50m to 100m from midpoint of the river and third was beyond 100m range.

Beach no. 38



Beach Profile:

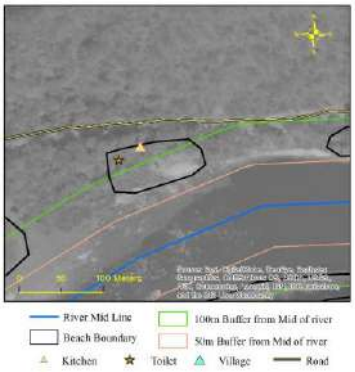
Location	78.4006 E	30.1383 N	Nature of Beach	60% Sand	35% Forest
Length & Width of Beach	L-199m,W-40m		River Width	120 m	
Bank to Beach distance	10m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right:	Left:	Area	7682 sq. m	
	110m	90m	Site	Right	
Legal status of land	Forests		Distance from Neighbouring Beach	Upstream: 73m Downstream: 151m	
Number of companies	Single				
No. of tents	20		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species. But we only found indirect signs of porcupine. There were signs of domestic livestock viz., goat pellets and cattle-dung.

Riparian quality: The riparian vegetation index for this beach was medium (9) indicating loss of natural habitat with not much lopping and clearing of shrubs.

Observations: Toilet found within a range of 50m to 100m from midpoint of the river.

Beach no. 39



Beach Profile:

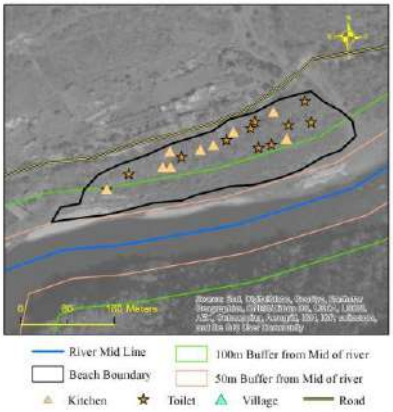
Location	78.3981 E	30.1382 N	Nature of Beach	40% Sand	30% Forest
Length & Width of Beach	L-100m,W-50 m		River Width	130 m	
Bank to Beach distance	20 m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right:	Left:	Area	4765 Sq. m	
	135	120	Site	Right Bank	
Legal status of land	Not Known		Distance from Neighbouring Beach	Upstream: 151m Downstream: 370m	
Number of companies	Single				
No. of tents	36		Beach Vul. Score	7.5	

Wildlife use: During the field survey of this beach there were no direct or indirect signs of wildlife species. According to local people this area is used by elephant for crossing the river.

Riparian quality: The riparian vegetation index for this beach was low (7) which shows great loss of natural vegetation by clearing the shrubs for pitching tents and building kitchen & toilets there. This beach was near to road connected with a trail.

Observations: Camp used forested area up till the road for camping activities. Toilet found inside the forest beyond 100m range from midpoint of the river.

Beach no. 40



Beach Profile:

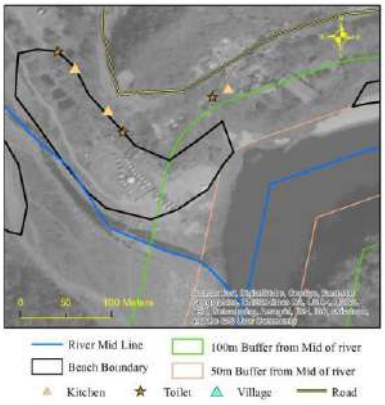
Location	78.3947 E	30.1367 N	Nature of Beach	60% Forest	30% Sand
Length & Width of Beach	L-467m,W-80m to 120m		River Width	90-120m	
Bank to Beach distance	10-20m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right:	Left:	Area	40435 sq. m	
	180m	65m	Site	Right	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 370m Downstream: 362m	
Number of companies	Sixteen				
No. of tents	236+		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species. But we only found pugmarks of small cat near to bank area as indirect sign.

Riparian quality: The riparian vegetation index for this beach was low (8) indicating extensive loss of vegetation in the form of lopping and clearing of vegetation for tents, kitchen and toilets.

Observations: Eleven toilets were found in this beach for various companies beyond 100m range from the midpoint of the river. Only one toilet was found in 50m to 100m range.

Beach no. 41



Beach Profile:

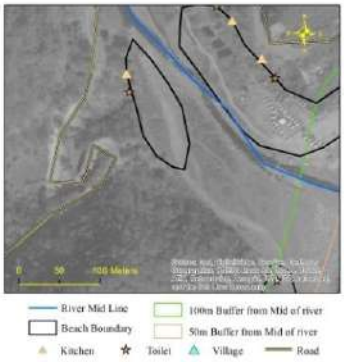
Location	78.3902 E	30.135 N	Nature of Beach	80% sand	20% Stone
Length & Width of Beach	L-293m,W-38 m		River Width	120 m	
Bank to Beach distance	20 m		Toilet Type	Both	
Either side bank distance from mid of river	Right:	Left	Area	16474 sq. m	
	118 m	68 m	Site	Right Bank	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 326m Downstream: 311m	
Number of companies	Twelve				
No. of tents	250		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were no direct or indirect signs of wildlife species. There were only signs of domestic livestock viz., goat pellets and cattle-dung was there.

Riparian quality: The Riparian vegetation index for this beach was low (6) showing loss of vegetation cover extensively. Toilets were pitched in the riparian vegetation.

Observations: Toilet and kitchen in private land beyond 100m from midpoint of the river.

Beach no. 42



Beach Profile:

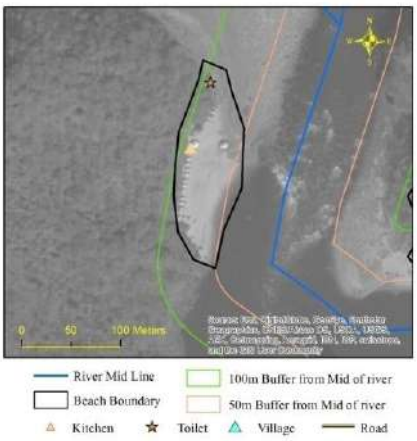
Location	78.3885 E	30.1357 N	Nature of Beach	50% Stone	50% Sand
Length & Width of Beach	L-159m,W-30 m		River Width	80m	
Bank to Beach distance	10m or 250m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right:	Left	Area	5227 sq. m	
	300m	70M	Site	Right Bank	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: <100m Downstream: <100m	
Number of companies	Single				
No. of tents	28		Beach Vul. Score	8	

Wildlife use: During field survey there were no direct signs of any wildlife species but we found tracks of small cat.

Riparian quality: The Riparian vegetation index for this beach was medium (9) indicating loss of natural vegetation. There were no signs of using the riparian area for tents and toilets.

Observations: Toilet found beyond 100m from midpoint of the river.

Beach no. 43



Beach Profile:

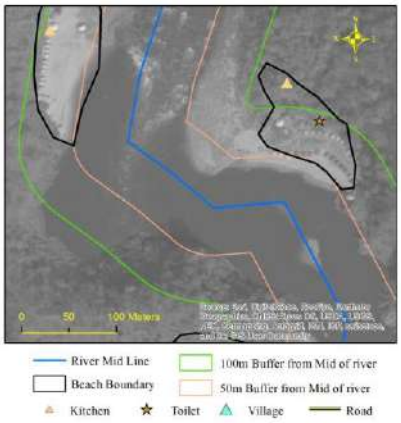
Location	78.3899 E	30.1327 N	Nature of Beach	30% Sand	70% stone
Length & Width of Beach	L-193m,W-45 m		River Width	72	
Bank to Beach distance	25 m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right:	Left	Area	9019 Sq. m	
	106	76 m	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: <100 m Downstream: 233m	
Number of companies	Single				
No. of tents	20		Beach Vul. Score	12	

Wildlife use: During the field survey of this beach there were no direct or indirect signs of wildlife species. There were only signs of domestic livestock viz., goat pellets and cattle-dung was there.

Riparian quality: The riparian vegetation index for this beach was low (6) indicating heavily disturbance due to lopping and clearance for toilets.

Observations: Toilet established 3m away from small stream and within the range of 50m to 100m from midpoint of the river.

Beach no. 44



Beach Profile:

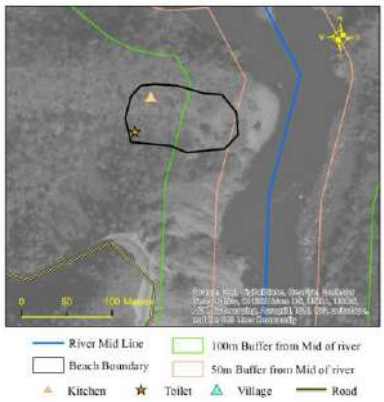
Location	78.3917 E	30.1318 N	Nature of Beach	40% Sand	40% Forest
Length & Width of Beach	L-145m,W-48 m		River Width	115 m	
Bank to Beach distance	10 m (height >20m)		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right:	Left:	Area	6091 sq. m	
	58 m	115 m	Site	Left Bank	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 233m Downstream: 250m	
Number of companies	Single				
No. of tents	40		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species but we found indirect signs viz., old pugmarks of leopard and small cat.

Riparian quality: The riparian vegetation index for this beach was low (8) which shows modification of natural vegetation due to lopping and clearance for pitching tents.

Observations: Toilet found in the range of 50m to 100m away from midpoint of river inside forested area. Height of beach above water level around 25m.

Beach no. 45



Beach Profile:

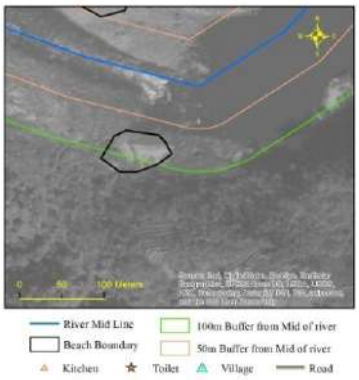
Location	78.3917 E	30.1297 N	Nature of Beach	70% Forest	30% Sand
Length & Width of Beach	L-64m,W-70 m		River Width	58	
Bank to Beach distance	30 m (height >20m)		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right:	Left:	Area	6469 Sq. m	
	129 m	59 m	Site	Right bank	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 250m Downstream: 1037m	
Number of companies	Single				
No. of tents	24+		Beach Vul. Score	12	

Wildlife use: During the field survey of this beach there were no direct or indirect signs of wildlife species. There were only goat pellets in abundance.

Riparian quality: The riparian vegetation index for this beach was low (8) showing the large loss of natural habitat by completely removing the trees, shrubs and grasses for pitching tents, kitchen and toilets. The entire beach was man made with very less amount of sand.

Observations: Manmade beach. Starts from the bank of the river. 65% of area under forest. Toilet inside the forest beyond 100m.

Beach no. 46



Beach Profile:

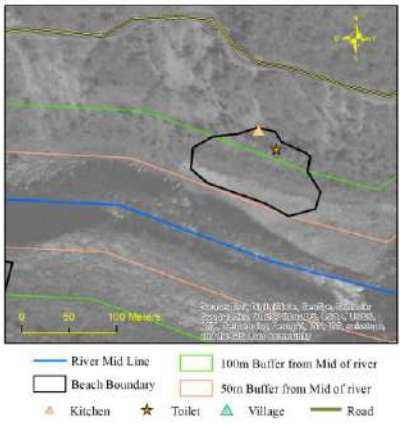
Location	78.3887 E	30.1203 N	Nature of Beach	50% Sand	30% Stone
Length & Width of Beach	L-68m,W-55 m		River Width	100 m	
Bank to Beach distance	5 m		Toilet Type	NA	
Either side bank distance from mid of river	Right:	Left:	Area	2463 sq. m	
	110 m	110 m	Site	Left Bank	
Legal status of land	NA		Distance from Neighbouring Beach	Upstream: 1037m Downstream: 182m	
Number of companies	NA				
No. of tents	NA		Beach Vul. Score	8	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species. But we only found fresh pugmarks of leopard.

Riparian quality: The riparian vegetation index for this beach was low (5) with complete modification of natural habitat. There was no camping in this beach.

Observations: This beach was undisturbed and not used for camping activities.

Beach no. 47



Beach Profile:

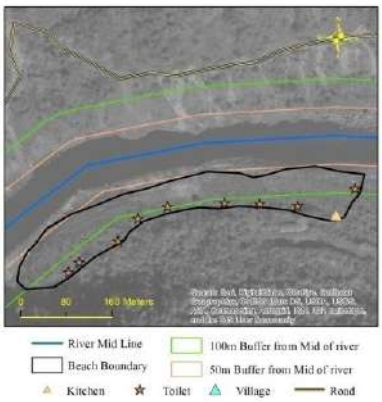
Location	78.388 e	30.1217 n	Nature of Beach	40% Sand	40% Stone
Length & Width of Beach	L-125m,W-60 m		River Width	60 m	
Bank to Beach distance	12 m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right:	Left:	Area	6973 sq m	
	102	120 m	Site	Right Bank	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 182m Downstream:518 m	
Number of companies	Single				
No. of tents	30		Beach Vul. Score	9	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species. But we only found old pugmarks of leopard as indirect sign.

Riparian quality: The riparian vegetation index for this beach was low (8) having extensive loss of natural habitat in the form of removal of riparian vegetation for pitching tents, making kitchen and toilets.

Observations: Toilet found beyond 100m from midpoint of the river.

Beach no. 48



Beach Profile:

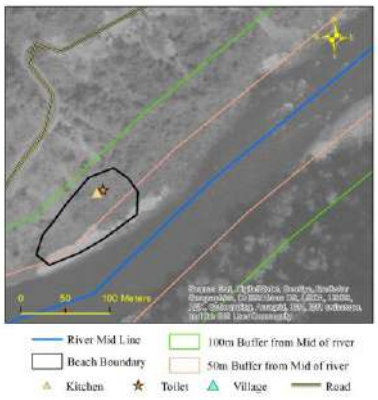
Location	78.3824 E	30.1211 N	Nature of Beach	50% sand	40% Forest
Length & Width of Beach	L-569m,W-45m to70m		River Width	70-90 m	
Bank to Beach distance	10-30m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right:	Left:	Area	38426 sq. m	
	105-135 m	40-55 m	Site	Left Bank	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 518m Downstream: 561m	
Number of companies	Seven				
No. of tents	68		Beach Vul. Score	10	

Wildlife use: During the field survey of this beach there was direct sighting of goral at opposite side of the bank; we have found indirect signs viz., fresh hoof mark of barking deer; and fresh pugmarks of small cat and we also found the tracks of the mongoose. There were also signs of livestock viz., goat pellets and cattle-dung.

Riparian quality: The riparian vegetation index for this beach was low (5) indicating great loss of natural habitat. This beach has toilets on clearance of vegetation with some lopping of trees. Permanent construction was done on this beach for kitchen.

Observations: Nine toilets found of different companies beyond 100m from midpoint of the river. One of them was in the range of 50m to 100m.

Beach no. 49



Beach Profile:

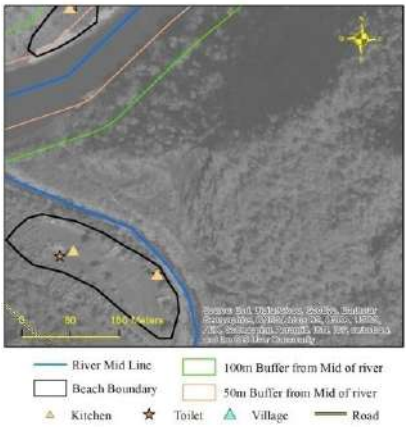
Location	78.3773 E	30.1184 N	Nature of Beach	40% Stone	30% Forest
Length & Width of Beach	L-118m,W-40 m		River Width	80 m	
Bank to Beach distance	5 m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right:	Left:	Area	5712 sq. m	
	85 m	55 m	Site	Right Bank	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 561m Downstream: 356m	
Number of companies	Single				
No. of tents	29		Beach Vul. Score	10	

Wildlife use: During the field survey of this camp there were no direct or indirect signs of wildlife species. There were only signs of domestic livestock viz., goat pellets and cattle-dung.

Riparian quality: The riparian vegetation index for this beach was low (6) indicating great loss of habitat and biota. Clearance of vegetation in small part of beach for toilets.

Observations: Toilet and kitchen inside forest on a rock in the range of 50m to 100m from midpoint of the river.

Beach no. 50



Beach Profile:

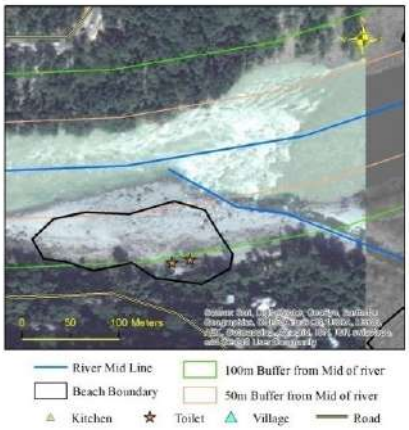
Location	78.3777 E	30.1155 N	Nature of Beach	Manipulated (side Stream)
Length & Width of Beach	L-274m,W-55 m		River Width	NA
Bank to Beach distance	NA		Toilet Type	Permanent Structure
Either side bank distance from mid of river	Right:	Left:	Area	22199 sq m
	NA	NA	Site	Left bank
Legal status of land	Private		Distance from Neighbouring Beach	Upstream: 356m Downstream: 270m
Number of companies	Two			
No. of tents	42		Beach Vul. Score	10.5

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species. But we only found pugmarks of leopard and hoof marks of barking deer as indirect sign.

Riparian quality: The riparian vegetation index for this beach was low (6) with complete modification of natural habitat in terms of removing the riparian vegetation for making a small trail. Toilets were very near to the stream.

Observations: Pits of toilets were far enough from mainstream to avoid contamination but close to small stream.

Beach no. 51



Beach Profile:

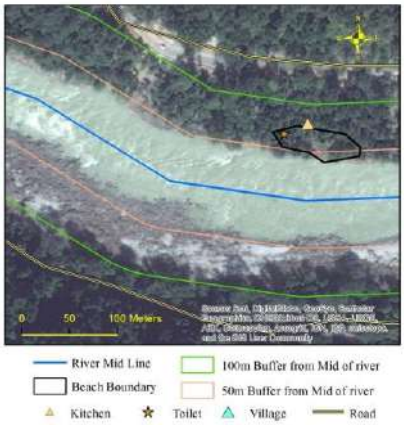
Location	78.3743 E	30.1166 N	Nature of Beach	65% Sand	35% Forest
Length & Width of Beach	L-157m,W-55 m		River Width	60 m	
Bank to Beach distance	40 m		Toilet Type	Permanent Structure	
Either side bank distance from mid of river	Right:	Left:	Area	10084 sq. m	
	30 m	125 m	Site	Left	
Legal status of land	Revenue		Distance from Neighbouring Beach	Upstream: 270m Downstream: 371m	
Number of companies	Two				
No. of tents	29		Beach Vul. Score	7	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species. But we only found pugmarks and scats of leopard as indirect sign. There were also signs of domestic livestock viz., goat pellet and cattle-dung.

Riparian quality: The riparian vegetation index for this beach was low (5) with entire modification of habitat and biota. A big trail was present which opens on the beach. Shrubs were removed for kitchen and toilets.

Observations: Permanent toilet beyond 100m from midpoint of the river.

Beach no. 52



Beach Profile:

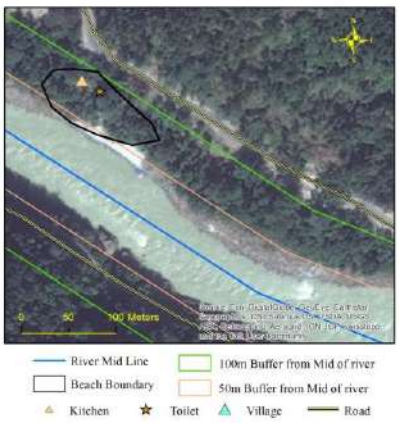
Location	78.3723 E	30.1175 N	Nature of Beach	Forest
Length & Width of Beach	L-74m,W-25 m		River Width	70 m
Bank to Beach distance	10 m (height 20m)		Toilet Type	Dry Pit
Either side bank distance from mid of river	Right:	Left:	Area	1852 sq. m
	70 m	100 m	Site	Right
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 371m Downstream: 807m
Number of companies	Single			
No. of tents	NA		Beach Vul. Score	12.5

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species. But we only found pugmarks and scat of leopard near to forest as indirect sign. There were also signs of domestic livestock viz., goat pellets and cattle-dung .

Riparian quality: The riparian vegetation index for this beach was low (5) showing great loss to natural habitat. The entire beach was formed by clearing the riparian vegetation including the lopping of trees with no part of sand.

Observations: Toilet found in the range of 50m to 100m from midpoint of the river.

Beach no. 53



Beach Profile:

Location	78.3649 E	30.1208 N	Nature of Beach	Forest
Length & Width of Beach	L-122m,W-30 m		River Width	75 m
Bank to Beach distance	15 m (height 20m)		Toilet Type	Dry Pit
Either side bank distance from mid of river	Right:	Left:	Area	4867 sq. m
	83m	40m	Site	Right Bank
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 807m Downstream: 172m
Number of companies	Single			
No. of tents	NA		Beach Vul. Score	11.5

Wildlife use: During the field survey of this beach there were no direct or indirect signs of wildlife species. The beach is highly used by domestic livestock.

Riparian quality: The riparian vegetation index for this beach was low (6) indicating loss of habitat. Much of the vegetation area was cleared for toilets, kitchen and shower.

Observations: Dry pit toilet found in the range of 50m to 100m from midpoint of the river.

Beach no. 54

Beach Profile:

Location	78.3635 E	30.1217 N	Nature of Beach	Forest
Length & Width of Beach	L-85m,W-45 m		River Width	70 m
Bank to Beach distance	25 m		Toilet Type	Dry Pit
Either side bank distance from mid of river	Right:	Left:	Area	3548 sq. m
	105 m	50 m	Site	Right Bank
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 172m Downstream: 1032m
Number of companies	Single			
No. of tents	NA		Beach Vul. Score	11

Wildlife use: During the field survey of this beach there were no direct or indirect signs of wildlife species. The beach is highly used by domestic livestock.

Riparian quality: The riparian vegetation index for this beach was low (6) with great loss of habitat. Entire beach was made by clearing the vegetation and lopping of many trees for the entire set up of camps including kitchen, toilets and tents.

Observations: Toilet found in the range of 50m to100m from midpoint of the river.

Beach no. 55

Beach Profile:

Location	78.355	30.1269	Nature of Beach	40% Stone	40% Sand
Length & Width of Beach	L-484m,W-40 m		River Width	80 m	
Bank to Beach distance	20 m		Toilet Type	Both	
Either side bank distance from mid of river	Right:	Left:	Area	28614 sq. m	
	90-110m	55-100 m	Site	Right Bank	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 1032m Downstream: 2346m	
Number of companies	Five				
No. of tents	61		Beach Vul. Score	11	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species. But we only found old scat of leopard near to forest and macaques on forest trail as indirect sign.

Riparian quality: The riparian vegetation index for this beach was low (4) indicating complete modification of the vegetation. Most part of vegetation was cleared to pitch the tents and for toilets and kitchen.

Observations: Some activity inside forests Camp area followed by private land. Out of 4 toilets, two were 100m away and rest of them comes under 50m to 100m from midpoint of the river.

Beach no. 56

Beach Profile:

Location	78.3335	30.1344	Nature of Beach	50% Sand	35% Forest
Length & Width of Beach	L-230m,W-55 m		River Width	80 m	
Bank to Beach distance	35-55m		Toilet Type	Dry Pit	
Either side bank distance from mid of river	Right:	Left:	Area	11595 sq. m	
	130 m	80 m	Site	Right	
Legal status of land	Forest		Distance from Neighbouring Beach	Upstream: 2346m Downstream: End point	
Number of companies	Two				
No. of tents	21+		Beach Vul. Score	11	

Wildlife use: During the field survey of this beach there were no direct signs of any wildlife species. But we only found hoof mark of Sambar about 15 meters away from the camp site near to forest as indirect sign. There were also signs of domestic livestock viz., goat pellets and cattle-dung.

Riparian quality: The riparian vegetation index for this beach was low (6) with major modification of the habitat. All shrub area got cleared along with lopping of few trees.

Observations: Near human habitation with toilets in the range of 50m to 100m from midpoint of the river.

Appendix 1

Number of camping sites recorded during the present survey

Beach No.	Name of camps (Total 98 camps)	Location		Nearby Village/ Forest beat
		Lat	Long	
1	Camp ganga riviera	30.0658	78.5162	Mahadev Chatti village
2	Geefive	30.0635	78.5143	Mahadev Chatti village
3	Real adventure group	30.0567	78.5143	Mahadev Chatti village
4	Star track	30.055	78.5133	Mahadev Chatti village
5	Great northen Himalaya	30.0634	78.4996	Kaudiyala beat
6	Amazing ganga	30.0724	78.5016	Kaudiyala beat
7	GMVN+ Remo expedition	30.0751	78.4994	Jhend village
8	Hide way	30.0701	78.4914	Sintali beat
9	Adventure links	30.0657	78.4912	Jhend village
10	Sand piper	30.0604	78.4886	Jhend village
11	Kwestral + river view	30.0579	78.486	Sintali-8 beat
12	Eagle nest + Gold cost	30.0576	78.4794	Sintali village
13	Ganges music	30.0662	78.4739	Sintali-9 beat
14	Advent tour+Byasi Paryatan samiti+Red chilli	30.065	78.4695	Sintali-8 beat
15	Alaknanda	30.0651	78.4642	Sintali-8 beat
16	J-2	30.0673	78.4608	Nirgadh-2 beat
17	Unused beach	30.0675	78.4565	Atali village
18	River N Ranges + River wild	30.0699	78.4501	Sintali-6 beat

Beach No.	Name of camps (Total 98 camps)	Location		Nearby Village/ Forest beat
19	Sweet 16	30.0727	78.4463	Nakurchi village
20	Traveller zone	30.0756	78.4416	Nakurchi village
21	Adventure journey+Ripply adventure	30.0769	78.4407	Sintali-6 beat
22	Unused beach	30.0773	78.4383	Nakurchi village
23	Aquatera	30.0817	78.4337	Sintali-4 beat
24	VNA resort+Real rafting adventure	30.085	78.4339	Malakunti village
25	Log out+ Sunrise adventure	30.0956	78.4344	Sintali-4 beat
26	GHE camp+Splash adventure	30.1025	78.4343	Sirasu
27	North star adventure(Ganga Paradise)	30.1053	78.4365	Sintali-3 beat
28	Good morning tours(Gugti camp)+Rana venture+Himalayan Journey	30.1097	78.4375	Sirasu village
29	Sea hawk+river rose	30.1125	78.4361	Sirasu village
30	Gular ghati paryatan vikas samiti(Three blind mice)	30.1136	78.4315	Shivpuri-5 beat
31	Cross fire	30.1219	78.4209	Kota village
32	wonderlast	30.127	78.4193	Shivpuri-5 beat
33	Green ganga adventure	30.1296	78.4178	Kota village
34	Garhwal Paryatan Vikas Samiti+Alpine star	30.1337	78.4129	Shivpuri-4 beat
35	Great Himalaya Outdoor (Butterfly adventure)	30.1362	78.4091	Shivpuri-3 beat

Beach No.	Name of camps (Total 98 camps)	Location		Nearby Village/ Forest beat
36	Himalayan River Runner	30.1363	78.4065	Shivpuri-3 beat
37	Explore Himalayan Adventure + Bhandari camp + Unique Himalayan Adventure	30.1372	78.4	Kota village
38	Snow Leopard	30.1383	78.4006	Shivpuri-3 beat
39	Jungle adventure group	30.1382	78.3981	Shivpuri-3
40	16 companies	30.1367	78.3947	Shivpuri (Bagwan)
41	12 companies	30.135	78.3902	Shivpuri (Haiwal dhaar)
42	1 company(Umedsingh)	30.1357	78.3885	Bawadi (Badal)
43	Ganga river tour	30.1327	78.3899	Brahmpuri-5beat
44	Mercury Himalayan Exploration	30.1318	78.3917	Kota village
45	River fun adventure	30.1297	78.3917	Brahmpuri-5 beat
46	Unused beach	30.1203	78.3887	Kota village
47	Wonder & wild X	30.1217	78.388	Brahmpuri-4 beat
48	7 companies- (zigzag adventure + Ganga Holiday adventure + Himalayn outfitter + wild expedition+splash adventure+adventure 3rd eye+Himalayan travel)	30.1211	78.3824	Dhunar village
49	Garhwal adventure	30.1184	78.3773	Brahmpuri-4 beat
50	Wildlife camp + Him river resort	30.1155	78.3777	Phool Chatti
51	Great himalaya Outdoor adventure+ Shree ganga adventure	30.1166	78.3743	Maral village
52	Shiv ganga adventure	30.1175	78.3723	Brahmpuri-3 beat

Beach No.	Name of camps (Total 98 camps)	Location		Nearby Village/ Forest beat
53	Garhwal himalaya exploration(Ganga nature camp)	30.1208	78.3649	Brahmpuri-2 beat
54	Himgiri adventure	30.1217	78.3635	Neergadh-2 beat
55	Dreamlife adventure+White bubble beach camp+Glacier tour adventure+ Outbond adventure+Himganga Adventure	30.1269	78.355	Brahmpuri-2 beat
56	Venture Himalayas + Amazing India	30.1344	78.3335	Neergadh-2 beat

Appendix 2

1. No camping activity shall be carried out in the entire belt of Kaudiyala to Rishikesh and the Government would abide by its statement made before the Tribunal on 31st March, 2015, till the regulatory regime in terms of this Judgement comes into force and is effectively implemented. However, we make it clear that Rafting per se does not cause any serious pollution of river or environment. We permit rafting activity to be carried on with immediate effect.
2. We constitute a Committee of officers not below the rank of a) Joint Secretary from the Ministry of Environment and Forests and along with a specialist in this field from the Ministry.
   b) Secretary, Department of Environment and Forest from the State of Uttarakhand.
   c) Member Secretary, Central Pollution Control Board.
   d) Chief Conservator of the Forest of the concerned area.
   e) Member Secretary, Uttarakhand Environment Protection and Pollution Control Board.
   f) Director of Wildlife Institute of India or his nominee of a very senior rank.

   Member Secretary, Uttarakhand Environment Protection and Pollution Control Board would be the Nodal Officer and Convenor of this Committee and responsible for submitting report to the Tribunal as per the directions of this judgment.

This Committee shall be at liberty to engage any Government Institution or a private body which have expertise in the line to prepare the regulatory regime and Regime is to be submitted to the Tribunal in accordance with law.

3. The Rapid Impact Assessment Report shall be treated as a relevant document and the Committee would conduct or get conducted further survey to satisfy itself.

4. The Committee shall consider all aspects of Environment, Wildlife, River and Biodiversity while preparing the relevant regulatory regime.

5. The Committee shall give recommendation for all preventive and curative measures and steps that should be taken for ensuring least disturbance to wildlife and least impact on the environment and ecology.

   5(A). The Committee shall specifically report in relation to carrying capacity of the area in regard to both the activities, in view of the fragile ecology of the area. (Carrying capacity in terms of visitor per day and other environmental loads of the activity taken together).

6. After preparation of this report which should be prepared within 3 weeks from the pronouncement of this Judgement, the State of Uttarakhand through Secretary, Forests would submit a Comprehensive Management Plan cum proposal for approval to MoEF. MoEF would consider the same in accordance with law and accord its approval

in terms of Section 2 of the Forest Conservation Act within 3 weeks thereafter.

7. The Committee shall ensure that it not only identifies the sites which can be appropriately used for camping activity but also the manner and methodology in which such sites should be put to use for carrying on of these activities. It is only those sites that are decided by the Committee that would form the part of the Management Plan to be submitted by the State of Uttarakhand to MoEF.

8. After grant of approval, the State of Uttarakhand shall issue an order under Section 2 of the Forest Conservation Act and give permits in terms of its policy.

9. We make it clear that we are not in any way entering upon the methodology that should be adopted by the State of Uttarakhand in economic and technical terms. In terms of revenue and technical aspects, the State is free to take its decisions.

10. We further direct that if the Committee is of the opinion that rafting stations and number of rafting shafts to be permitted should be more than camp sites, it may so recommend but then, those rafting stations shall be used for very limited purposes of picking up and dropping the visitors without any other infrastructure.

11. We hope that the economic interest of the State of Uttarakhand would be duly kept in mind by the Committee and it would ensure that local persons should

be provided with maximum chances of employment or other financial gains resulting from this Eco-Tourism.

12. We hereby impose complete prohibition on use of any plastic in the entire belt covered under this judgment. (Plastic such as plastic bags, plastic glass, plastic spoons, plastic bottles package and such other disposable items).
13. It shall be obligatory upon every person to whom permit/license for camping is granted by the State to collect the Municipal Solid Waste or all other wastes from the camping site at its own cost and ensure their transport to the identified sites for dumping.
14. If any licensee fails to comply with these directions, the department would take action in accordance with law and it would be treated as a breach in terms of the license.
15. In this regard complete record shall be maintained at the end of the licensee of the site as well as at the dumping site, in the records of the concerned authority.
16. No structure of any kind would be permitted to be raised, temporary, semi-permanent or permanent. We make it clear that making of the cemented platforms or bricked walls would not be permitted within the limits afore-stated.

    This will be done with reference to River Ganga Data maintained by the Central Water Commission. Within these 100 meters any construction activity what so ever would not be permitted under any circumstances.

Wherever the road intervenes between 100 meters defined space, in that event, the camping can be permitted across the road towards the hill side.

17. The Committee also has to make this Report in relation to source, quantum of Water and source of Power needed keeping in view the camping activity.

111. The application filed by Jaswinder Kaur where she has prayed various reliefs also has been disposed in terms of the order in this case. As such, both the above cases have been disposed of without any order as to cost.

Justice Swatanter Kumar
Chairperson

Justice M.S. Nambiar
Judicial Member

D.K. Agrawal
Expert Member

A.R. Yousuf
Expert Member

New Delhi
10th December, 2015

Appendix 3

HEAD OFFICE

Uttarakhand Environment Protection and

Pollution Control Board

29/20, Nemi Road, Dalanwala, Dehradun, Uttarakhand

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Phone: (0135) 2658086; Fax: (0135) 2718092; E-mail: msukpcb@yahoo.com; Web: www.ueppcb.uk.gov.in

Ref: UEPPCB/HO/Gen-365/2016/ January , 2016

Meeting of the Committee constituted by the Govt. of Uttarakhand vide office order no. 939/X-3-15-15(24)/2015 dated 22.12.2015, in compliance of the judgement of the Hon'ble National Green Tribunal (NGT) in the matter of Application No. 87/2015 Social Action for Forests and Environment Vs Union of India & Ors on dated 10.12.2015.

Minutes of the Meeting

The first meeting of the Committee was held on dated **01.01.2016** under the Chairmanship of the **Additional Chief Secretary, Govt. of Uttarakhand**. Following were present in the meeting:

1. Shri S. Ramaswamy, Additional Chief Secretary, Govt. of Uttarakhand.
2. Sh. Ajay Kumar, APPCF, MOEF&CC, Regional Office (Central), Dehradun.
3. Sh. Gambhir Singh, APPCF (Garhwal), Forest Deptt. Uttarakhand.
4. Dr. G.S. Rawat, Dean, Wild Life Institute (WII), Dehradun
5. Shri Vinod Kumar Singhal, Member Secretary, UEPPCB, Dehradun
6. Ms Meenakshi Joshi, Addl. Secretary, Forests & Environment, Govt. of Uttarakhand, Dehradun.
7. Shri Rahul, DFO, Narendra Nagar, Tehri Garhwal.

The meeting started with welcome note of the Chairman and brief account of the judgement pronounced by the **Hon'ble National Green Tribunal (NGT)**. Member Secretary, Uttarakhand Environment Protection and Pollution Control Board (UEPPCB) highlighted the point wise directions issued by the Hon'ble NGT before the Committee. During the meeting it was informed that there are about 100 locations where beach camping are being carried out which includes 37 locations of reserve forest and rest are outside the forest area. Dr. G.S. Rawat, Dean, WII informed that the study carried out by the WII in the year 2010 identified about 13 points where wild animal come to drink water and these points may consider as sensitive points. He further emphasised on ecological importance of tributaries/rivulets of the river Ganga.

Contd… Page-2

In compliance of the **Hon'ble NGT** directions, the Committee decided following course of action:

1. The locations of beach camping from Kaudiyala to Rishikesh are consisting of forest as well as civil lands. Therefore, river Ganga would be considered as a unit and all camping locations between Kaudiyala to Rishikesh shall be covered.
2. The representatives of associations of beach camping/rafting will be invited in the next meeting to record their views in order to comply the directions of the Hon'ble NGT.
3. The detailed list of beach camping and rafting to be obtained from the respective district magistrate and forest Department.
4. The UEPPCB shall issue public notice in news paper about the Hon'ble NGT judgement dated 10.12.2015.
5. The Wildlife Institute of India (WII) would be made a presentation based on rapid assessment study carried out by the WII, before the Committee.
6. Regulatory regime including list of prohibition, regulation and permitted activities in the beach camps to be prepared.
7. Carrying capacity study shall be undertaken by the Wildlife Institute of India (WII) on urgent basis in the light of the Hon'ble NGT order. Further also requested to submit a draft proposal of Carrying capacity study by WII to the UEPPCB for financial assistance.
8. Water quality monitoring at upstream of Kaudiyala; upstream of Shivpuri; downstream of Shivpuri and upstream of Laxmanjhulla shall be undertaken by the UEPPCB on quarterly basis.
9. Pick up and drop points of shall be identified.
10. Negative list for beach camping and rafting shall be prepared.
11. To fulfil the environmental compliances, an economic instrument like security of appropriate amount in term of Bank Guarantee etc. may be introduced.

The next meeting of the Committee is fixed on **07.01.2015** at 11:00 AM onwards at the meeting hall of Watershed Directorate, Indira Nagar, Dehradun, where representatives of associations of beach camping/rafting will be invited to record their views.

The meeting ended with thanks to and from the Chair.

Member Secretary

Copy to: Following for kind information and necessary action please.

1. PPS to Additional Chief Secretary, Forests & Environment, Govt. of UK for kind information to Additional Chief Secretary please.
2. Sh. Ajay Kumar, APPCF, MOEF&CC, Regional Office (North Central Zone), P.O. New Forest, Dehradun (E-mail: moef.ddn@gmail.com).
3. Dr. A.B. Akolkar, Member Secretary, Parivesh Bhawan, East Arjun Nagar, Shahdara, Delhi (Fax: 011-22305793).
4. Shri Gambhir Singh, APPCF (Garhwal), Forest Deptt., Dehradun.
5. Dr. G.S. Rawat, Dean, WII, Dehradun (E-Mail: rawatg@wii.gov.in).
6. Ms Meenakshi Joshi, Addl. Secretary, Forests & Environment, Govt. of Uttarakhand, Dehradun.
7. Sh. S.P. Subuddhi, Conservator of Forest, Bhagirathi Circle, Mini-Ki-Reti, Rishikesh (Fax: 0135-2431159).
8. Sh. Rahul, DFO, Narendra Nagar, Tehri Garhwal (Fax-0135-2442052).

Member Secretary

Appendix 4

Wildlife Use Index scoring

Beach no.	RB/LB	Wildlife Species							Remarks	Wildlife usage score
		Leopard	Barking Deer	Goral	Small Cat	Hyena	Porcupine	Sambar		
1	LB	0	0	0	0	0	0	0		**0**
2	LB	0	0	0	0	0	0	0		**0**
3	LB	2	0	0	0	0	0	0	5	**7**
4	LB	0	0	0	0	0	0	0		**0**
5	RB	2	0	0	0	0	0	0		**2**
6	RB	0	0	0	0	0	0	0		**0**
7	LB	2	3	5	0	0	1	0	5	**16**
8	RB	0	0	0	0	0	0	0		**0**
9	LB	0	0	0	1	0	1	0		**2**
10	LB	2	0	0	1	0	0	0		**3**
11	RB	0	0	0	0	0	0	0		**0**
12	RB	0	0	0	0	0	0	0		**0**
13	RB	2	3	5	0	0	1	0		**11**
14	RB	2	0	0	0	0	0	0		**2**
15	RB	2	0	0	0	0	0	0		**2**
16	RB	2	0	0	0	0	0	0		**2**
17	RB	0	0	0	1	0	0	0		**1**
18	RB	2	3	0	1	0	0	0		**6**
19	LB	2	0	5	0	0	0	0	5	**12**
20	LB	2	0	0	1	0	1	0		**4**
21	RB	2	0	0	0	1	0	0		**3**

Beach no.	RB/LB	Wildlife Species							Remarks	Wildlife usage score
		Leopard	Barking Deer	Goral	Small Cat	Hyena	Porcupine	Sambar		
22	LB	2	3	0	0	0	0	0		**5**
23	RB	2	0	0	0	1	0	0		**3**
24	LB	0	0	0	0	0	0	0		**0**
25	RB	2	0	0	0	0	1	0		**3**
26	LB	2	0	0	1	1	1	0		**5**
27	RB	2	0	0	0	1	0	0		**3**
28	LB	2	0	5	1	1	0	0		**9**
29	LB	2	0	0	1	0	0	0		**3**
30	RB	0	0	0	0	0	0	0		**0**
31	LB	2	0	0	0	0	0	0		**2**
32	RB	2	0	0	0	0	0	0		**2**
33	LB	2	0	0	0	0	0	0		**2**
34	RB	2	0	0	0	1	0	0	5	**8**
35	RB	0	3	0	0	0	0	0		**3**
36	RB	0	0	0	0	0	0	0		**0**
37	LB	2	3	5	0	0	0	5	5	**20**
38	RB	0	0	0	0	0	1	0		**1**
39	RB	0	0	0	0	0	0	0		**0**
40	RB	0	0	0	1	0	0	0		**1**
41	**RB**	0	0	0	0	0	0	0		**0**
42	RB	0	0	0	1	0	0	0		**1**
43	RB	0	0	0	0	0	0	0		**0**
44	LB	2	0	0	1	0	0	0		**3**
45	RB	0	0	0	0	0	0	0		**0**

Beach no.	RB/LB	Wildlife Species							Remarks	Wildlife usage score
		Leopard	Barking Deer	Goral	Small Cat	Hyena	Porcupine	Sambar		
46	LB	2	0	0	0	0	0	0	5	**7**
47	RB	2	0	0	0	0	0	0		**2**
48	LB	0	3	5	1	0	0	0	2	**11**
49	RB	0	0	0	0	0	0	0		**0**
50	LB	2	3	0	0	0	0	0		**5**
51	LB	2	0	0	0	0	0	0		**2**
52	RB	2	0	0	0	0	0	0		**2**
53	RB	0	0	0	0	0	0	0		**0**
54	RB	0	0	0	0	0	0	0		**0**
55	RB	2	0	0	0	0	0	0		**2**
56	RB	0	0	0	0	0	0	5		**5**

Appendix - 5

Beach Vulnerability Index

Beach NO.	**RB/LB**	Distance of camp from the road	Distance from human habitation	Width of the beach	Distance to toilet and kitchen from mid of the river	Proportion of camp under forested habitat	Structural Vulnerability score
1	LB	3	3	1	4*	3	14
2	LB	3	3	1	4*	3	14
3	LB	3	1	1	2*	1	8
4	LB	3	1	1	2*	1	8
5	RB	2	3	2	2	1	10
6	RB	1	1	1	2*	1	6
7	LB	2	1	2	2	1	8
8	RB	1	3	3	2	1	10
9	LB	1	3	1	2*	1	8
10	LB	3	2	1	2	1	9
11	RB	2	2	2	2	1	9
12	RB	3	3	1	2	1	10
13	RB	3	2	1	2	1	9
14	RB	3	2	2	1.5	1	9.5
15	RB	3	3	2	2	1	11
16	RB	2	1	2	2	1	8
17	RB	2	1	2	1	1	6
18	RB	2	3	1	1	1	8
19	LB	3	3	1	2	1	10
20	LB	3	3	2	4	1	13

Beach NO.	**RB/LB**	Distance of camp from the road	Distance from human habitation	Width of the beach	Distance to toilet and kitchen from mid of the river	Proportion of camp under forested habitat	Structural Vulnerability score
21	RB	2	3	2	2	1	10
22	LB	3	3	2	1	1	9
23	RB	3	2	2	2	1	10
24	LB	3	1	2	2*	3	11
25	RB	1	3	2	2	3	11
26	LB	3	3	1	1	1	9
27	RB	1	3	2	2	1	9
28	LB	3	1	1	2*	1	8
29	LB	3	1	1	4*	1	10
30	RB	2	2	1	4*	1	10
31	LB	3	2	1	2*	1	9
32	RB	3	3	2	2	1	11
33	LB	3	3	1.5	4*	1	12.5
34	RB	2	3	1	1	1	8
35	RB	2	3	2	4*	3	14
36	RB	2	3	1	2	1	9
37	LB	3	3	1	3*	1	11
38	RB	1	3	2	2	1	9
39	RB	1	3	1.5	1	1	7.5
40	RB	1	1	1	4*	2	9
41	RB	1	1	2	4*	1	9
42	RB	1	1	2	3	1	8
43	RB	3	2	2	4*	1	12

Beach NO.	**RB/LB**	Distance of camp from the road	Distance from human habitation	Width of the beach	Distance to toilet and kitchen from mid of the river	Proportion of camp under forested habitat	Structural Vulnerability score
44	LB	3	2	2	1	1	9
45	RB	3	3	1	2*	3	12
46	LB	3	3	1	0	1	8
47	RB	2	3	2	1	1	9
48	LB	3	3	1	2*	1	10
49	RB	2	3	2	2	1	10
50	LB	2	1	1.5	5*	1	10.5
51	LB	1	2	1	2*	1	7
52	RB	2	3	2.5	2	3	12.5
53	RB	1	3	2.5	2	3	11.5
54	RB	1	3	2	2	3	11
55	RB	1	3	2	3*	2	11
56	RB	3	3	1.5	1.5	2	11

*obtained score is multiplied by factor (2), because beaches having permanent toilet structures

Note:

1) In some cases, score for distance of extreme edge of beach from mid of river is given 1.5 or 2.5 instead of 2 or 3. In these case some time beach width is higher than limit while at some places lower.
2) In some beaches score for toilet is given 1.5 or 2.5 instead of 2 or 3, in these cases beaches having both type of toilets.

Appendix 6

Eco and Adventure Tourism Model of Camping along with Rafting The way forward

- The Eco tourism model of camping and rafting along with the option of various other water and land based recreational activities originated in Uttarakhand in the mid 80's.
- This was conceived and started by few adventure sportsmen, naturalist and conservationist as an alternative livelihood entrepreneurship. This sustainable model originated out of passion for nature conservation and adventure sports where one could engaged and practice nature based activities and promote conservation of the natural resources around the river habitat and yet sustain a respectable livelihood.
- This model of camping by the river on a sandy beach which emerges post monsoon after the river recedes and again submerges during monsoon is unique in the world as an Eco and Adventure Tourism activity. There is no parallel to this kind of temporary river beach campaign over 8 top 9 months of a year available any where in the world. This is indeed the finest home grown small scale and minimum impact Eco and Adventure Tourism enterprise of Uttarakhand which has brought a significant socio economic development in this region.
- This success story has sustained and grown over 3 decades to be one of the most popular Eco and Adventure Tourism destination of India. This is indeed a gift of Uttarakhand to India. This model of tourism has a valuable contribution towards inspiring "Eco and Adventure Tourism" as an alternative livelihood opportunity which can sustain the local community and yet conserve the natural resources. It would be pertinent to mention that this Eco and Adventure Tourism model has inspired several "Infrastructure Development and Investment Program in Tourism " (IDIPT) project in South East Asian countries including Uttarakhand. Funded by Asian Development Bank and World Bank, yet the existing Industry struggles to find support and recognition from the government for there contribution towards developing this unique products which supports over 25,000 people.
- For further growth and systematic development it would be imperative to formalize the carrying capacity for all camping sites as much as the capacity of the river for rafting. By limiting mass tourism, it will ensure minimum impact on the Eco sensitive natural habitat.

a) The Industry should be guided by the principle's of "Eco sensitivity".
b) Only tent structure of temporary nature should be allowed.

c) Should adhere and strive towards minimum impact practices because of the proximity to the river and reserved forest.

d) Should adopt low volume Eco Tourism model and not mass Tourism.

e) The foot fall of Tourist needs to be limited as per the total area available to each camp. Since the ratio of higher volume to a smaller camp area will generally have higher impact of sound, light, waste-solid and liquid that which might not be contained within the camp area. Also crowding of the place will adversely affect the wilderness experience of the visitor and the peace of the area. Therefore it would not meet the objectives of Eco/ Nature Tourism.

- A suggestive figure to limit over crowding has been attempted where 80 to 85 percent of total camp area can be left free of any tent structures. This can be deliberate to arrive at a reasonable figure.
- The simplest method would be to allot a specific minimum area to each tourist tent unit. Which can be fixed at 1 tent unit per 250 Sq mtr area . Therefore an area of 5000 Sq mtr can accommodate 5000 Sq mtr ÷ 250 Sq Mtr / tent = 20 tents.
- Wherein, the actual covered area of each tourist tent unit would be, living and toilet tent area of approx. 20 to 25 Sq Mtr per unit plus approx. 20 to 25 Sq Mtr area shared by each tent unit from the "common necessary facility" for the entire camp including Kitchen, Dinning, lounging, stores and staff tent with toilet and bath, waste management unit. Therefore the approximate total area actually covered would not exceed 40 to 50 Sq Mtr out of 250 Sq Mtr. This would leave 210 to 200 Sq Mtr of area free that would count to 86 to 80% vacant area per unit and hence eventually 86 to 80% of the total area.
- The maximum tents to be pitched should be capped at 50 No's. It would be advisable to limit the tourist tents at 50 even if any camp site has larger area to hold than that.

Appendix – 7

प्रेषक,

वी० डी० काण्डपाल,
विशेष सचिव,
वन विभाग,
उत्तर प्रदेश शासन।

सेवा में,

महानिदेशक,
पर्यटन,
देहरादून।

वन अनुभाग-2 लखनऊः दिनांकः 25 सितम्बर, 99

विषयः- पर्वतीय क्षेत्रों के वनों में रीवर राफ्टिंग की अनुमति दिया जाना।

महोदय,

उपर्युक्त विषय के संबंध में शासनादेश संख्याः 6713/14-2-93-944/1988, दिनांक 28 अक्टूबर, 1993 एवं शासनादेश संख्याः 7429/14-2-93-944/1988, दिनांक 4 अप्रैल, 1994 को अवकृमित करते हुए मुझे यह कहने का निदेश हुआ है कि पर्वतीय क्षेत्र के रक्षित/आरक्षित वनों में बहने वाली नदियों में राफ्टिंग की अनुमति एवं राफ्टिंग कम्पनियों को नदी के किनारे वाली स्थानों (बीच) का आवंटन शासन द्वारा सम्यक विचारोपरान्त निम्नलिखित शर्तों एवं प्रतिबंधों के अधीन दिये जाने का निर्णय लिया गया है :-

(1) रीवर राफ्टिंग की अनुमति निदेशक, पर्यटन (पर्वतीय) द्वारा दी जायेगी।

(2) राफ्टिंग की अनुमति यथासम्भव उन्हीं कम्पनियों को दिये जाने पर विचार किया जाये जिन्हें गत वर्षों में अनुमति दी गई हो। साथ ही इस संबंध में नदी की राफ्टिंग हेतु कैरींग कैपेसिटी पर भी विचार कर अनुमति दी जाये।

(3) निदेशक, पर्यटन से राफ्टिंग हेतु अनुमति प्राप्त कम्पनियों द्वारा संबंधित वन संरक्षक को आवेदन करने पर ही उन्हें अस्थायी कैम्प लगाने हेतु बीचों का आवंटन कम्पनी के कार्य एवं आचरण के मूल्यांकन के उपरान्त वन संरक्षक द्वारा किया जायेगा। वन संरक्षक से अनुमति प्राप्त किये जाने के उपरान्त ही कम्पनियां राफ्ट चलायेंगी।

(4) रीवर राफ्टिंग के लिये अस्थायी कैम्प लगाने हेतु अनुमति एक बार में पांच वर्षों के लिये दी जायेगी और इसका नवीनीकरण, यदि कम्पनी

---2/-

दवारा किसी शर्त का उल्लंघन न किया गया हो, वन संरक्षक द्वारा कम्पनी के कार्य एवं आचरण का पुनर्मूल्यांकन कर प्रतिवेदन भेजा जायेगा।

§7§ केन्द्रीय एवं राज्य शुल्क [illegible] सम्बन्धित वन संरक्षक द्वारा निर्धारित किया जायेगा और निर्धारित शुल्क जमा करने के पूर्व जमा करना होगा।

§8§ प्रभागीय वनाधिकारी द्वारा निर्धारित स्थानों पर कैम्प लगाये जायेंगे।

§7§ कैम्प में रह रहे व्यक्तियों को आग्नेय अस्त्र एवं विस्फोटक सामग्री रखने की अनुमति नहीं होगी।

§8§ कैम्प साईट के आस-पास के जंगल में अग्नि सुरक्षा का दायित्व आवंटी कम्पनी का होगा।

§9§ किसी भी राफ्टिंग कम्पनी को अधिकतम कितने राफ्ट चलाने का अधिकार होगा तथा बीच में कितने टेण्ट लगाये जायेंगे व कितने पर्यटक एक बार में आवास करेंगे, इसका निर्धारण महानिदेशक, पर्यटन/पर्यटन की अध्यक्षता में सम्बन्धित वन संरक्षक एवं भारतीय वन्य जीव संस्थान, देहरादून के एक प्रतिनिधि की एक संयुक्त बैठक में विचार-विमर्श कर किया जायेगा।

§10§ कम्पनी द्वारा प्रत्येक राफ्ट पर पेन्ट द्वारा वन विभाग के निर्देशानुसार नम्बर अंकित करना अनिवार्य होगा।

§11§ प्रत्येक राफ्ट पर गाईड एवं प्रत्येक पर्यटक हेतु लाईफ जैकेट व हेलमेट अनिवार्य रूप से होगा। गाईड को पर्यटन विभाग द्वारा प्रदत्त फोटोयुक्त पहचान पत्र राफ्टिंग के समय अपने पास रखना होगा।

§12§ सायंकाल 6.00 बजे के उपरान्त कोई राफ्ट नदी में नहीं चलाई जायेगी।

§13§ प्रत्येक पर्यटक को सुरक्षित राफ्टिंग कराने का दायित्व संबंधित राफ्टिंग कम्पनी का होगा।

§14§ किसी भी राफ्ट या नाव को भारत सरकार के दिशा-निर्देशों के अनुरूप आउट बोर्ड मोटर लगाने की अनुमति नहीं होगी।

§15§ प्रत्येक राफ्टिंग कम्पनी के लिये यह आवश्यक होगा कि वे प्रत्येक राफ्टिंग ट्रिप में पर्यटकों व गाईड का नाम व पता रजिस्टर में अंकित करेंगे जिसे सीजन समाप्ति के बाद वन संरक्षक के निर्देशानुसार जमा करेंगे।

§16§ कैम्प में प्रकाश व्यवस्था हेतु जेनरेटर एवं जलापूर्ति हेतु डीजल/पैट्रोल/मिट्टी तेल से चालित पम्पों का प्रयोग निषिद्ध होगा।

§17§ रात्रि में प्रकाश व्यवस्था केवल टेन्टों के भीतर सीमित रखी जायेगी। तेज रोशनी का उपयोग नहीं किया जायेगा। केवल लालटेन व सौर ऊर्जा चालित रोशनी का प्रयोग किया जायेगा।

§18§ रात्रि 9.00 बजे के बाद कैम्प में रोशनी करना अनुमन्य नहीं होगा।

§19§ रेडियो, वीडियो, टेप रिकार्डर, सामुहिक गाना बजाना, पटाखे व आतिशबाजी तथा वाद्य यंत्रों का प्रयोग कैम्प स्थल में निषिद्ध रहेगा।

§20§ कैम्प स्थल पर गार्बेज का संग्रहण निर्धारित स्थान पर इस प्रकार किया जायेगा कि कोई भी कूड़ा कैम्पिंग स्थल पर फैलने न पाये। एकत्रित कूड़े को कम्पनी स्वयं उठाकर निकटतम नगरपालिका/ टाउन एरिया के निर्धारित कूड़ादानों में डलवायेंगे। किसी भी दशा में कूड़ा न तो नदी में फेंका जायेगा और न ही उसे कैम्पिंग स्थल पर जलाया जायेगा।

§21§ मल मूत्र त्याग हेतु केवल ड्राई पिट सुविधा राजि अधिकारी द्वारा बताई गई संख्या के अनुसार निर्धारित स्थान पर पर्यटकों को कम्पनी द्वारा उपलब्ध कराई जायेगी। ड्राई पिट शौचालय सैण्ड बैंक के ऊपरी किनारे से यथासम्भव 60 मीटर की दूरी पर खोदे जायेंगे।

§22§ किसी भी बीच का वह भाग जो वन अधिकारी द्वारा वन्य जन्तुओं के आगमन हेतु चिन्हित किया जाये, उस भाग को कैम्पिंग हेतु प्रयोग में नहीं लाया जायेगा।

§23§ कैम्प में भोजन पकाने हेतु जलौनी पुकाष्ठ का प्रयोग नहीं किया जायेगा।

§24§ किसी भी कम्पनी को कैम्प स्थल पर राजपत्रित अवकाश, शनिवार व रविवार के अतिरिक्त कैम्प फायर करने की अनुमति नहीं होगी। कैम्प फायर जमीन पर न करके बड़े आकार के तसलों पर करना होगा। कैम्प फायर से उत्पादित राख, कोयला व अधजली लकड़ी को नदी में नहीं बहाया जायेगा बल्कि उन्हें गार्बेज की भांति नगरपालिका के कूड़ादानों में डालना होगा। कैम्प फायर हेतु जलौनी वन निगम के डिपो से क्रय की जायेगी और किसी भी दशा में स्थानीय ग्रामवासियों से जलौनी क्रय नहीं की जायेगी। कैम्प फायर रात्रि 11.00 बजे के उपरान्त अनुमन्य नहीं होगा।

§25§ रसोई के बर्तनों व उपकरणों आदि की सफाई हेतु डिटर्जेन्ट का प्रयोग नहीं किया जायेगा। कैम्प साईट पर कपड़े धोना वर्जित होगा।

§26§ वन अधिकारियों को यह अधिकार होगा कि वे किसी भी समय कैम्प स्थल, टेन्टों तथा राफ्टिंग में प्रयुक्त उपकरणों आदि का निरीक्षण कर सकते हैं।

§27§ कम्पनी द्वारा उपर्युक्त किसी भी शर्त का उल्लंघन किये जाने पर राफ्टिंग एवं कैम्पिंग हेतु प्रदत्त अनुमति तत्काल निरस्त कर दी जायेगी तथा कम्पनी के विरुद्ध भारतीय वन अधिनियम, 1927 एवं अन्य सुसंगत नियमों के अधीन कार्यवाही की जायेगी।

---4/-

2- अनुरोध है कि कृपया प्रकरण में तदनुसार अनुवर्ती आवश्यक [illegible] सुनिश्चित कराई जाये।

भवदीय,

(बी0 डी0 कण्डवाल)
विशेष सचिव।

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित:-

1- सचिव, पर्यटन विभाग, उत्तर प्रदेश शासन, लखनऊ।
2- प्रमुख वन संरक्षक, उत्तर प्रदेश, लखनऊ।
3- प्रमुख वन संरक्षक, उत्तराखण्ड, नैनीताल।
4- आयुक्त, गढ़वाल मण्डल, पौड़ी गढ़वाल।
5- आयुक्त, कुमाऊं मण्डल, नैनीताल।
6- मुख्य वन संरक्षक, उत्तराखण्ड, नैनीताल।
7- मुख्य वन संरक्षक, कुमायूं, नैनीताल।
8- मुख्य वन संरक्षक, गढ़वाल, देहरादून।
9- नोडल अधिकारी एवं वन संरक्षक, वन उपयोग वृत्त, उ0प्र0, लखनऊ।
10- उत्तराखण्ड क्षेत्र के समस्त जिलाधिकारी।
11- उत्तराखण्ड क्षेत्र के समस्त वन संरक्षक एवं प्रभागीय वनाधिकारी।

आज्ञा से,

(रमा शंकर)
उप सचिव।