

Gujarat Council on Science & Technology sponsored
Asian Waterbird Census (AWC) 2015 Porbandar

Organised by

**Shri Sahajanand Swami District Community
Science Centre- Porbandar
Porbandar Forest Division- Porbandar
Indian Coastguard, Porbandar
Green Wildlife Conservation Society
Mokarsagar Wetland Conservation Committee**



Final Report- 2015

Gujarat Council on Science and Technology (GUJCOST) sponsored
Asian Waterbird Census (AWC) 2015 Porbandar

Project Co-ordinator

Mr. Dhaval Vargiya, Science Co-ordinator, SSDCSC, Swaminarayan Gurukul,
Chhaya Main Road, Porbandar-360575

Major contributors:

- 1.** Dr. Narottam Sahoo, Adviser & Member Secretary, GUJCOST, Gandhinagar
- 2.** Shashtri Swami Bhanuprakasdasji, Director, SSDCSC, Porbandar
- 3.** Dr. Lalit Parmar, DCF, Porbandar Forest Division- Porbandar
- 4.** IG Rajesh Makwana, Indian Coastguard, Porbandar
- 5.** Mr. Kishore Joshi, Scientific Adviser, Mokarsagar Wetland Conservation Committee
- 6.** Mr. Chirag Tank, President, Green Wildlife Conservation Society- Porbandar
- 7.** Mr. Vivek Bhatt, Science Communicator, SSDCSC

Text and Photographs: Mr. Dhaval Vargiya

Group Photographs: Karabhai Oedra, Maheshbhai, Nayan Thanki, & Mahendra Modi

Design: BirdGuard Nature Stocks (Contact: 9904422855)

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Table 1: Participants of Asian Waterbird Census (AWC) 2015 Porbandar

No.	Name	Contact details	Address	Route
1	Shri Lalit Parmar	02862252413	Porbandar Forest Division, Porbandar	01
2	Dr. Kamlesh Mehta	9824245400	45- Jalaram Colony, Porbandar	01
3	Dhaval Vargiya	9824822855	SSDCSC	01
4	Ashraf Ali	9978888598	At Vadinar, Taluka: Kambhaliya, Dist: Dwarka	01
5	Jaypalsinh Jadeja	9636345566	“Amba Bhavan” 8- Patel colony, Rd no ¾, Jamnagar	02
6	IG Rajesh Makwana	9428214745	Coastguard, Porbandar	02
7	Vivek Bhatt	9712582958	SSDCSC	02
8	Karan Karavadra	9687571122	Vadi Plot, Porbandar	02
9	Punit Kariya	9426995707	“Nirant”, 27- Jalaram Colony, Porbandar	03
10	Paresh Pitroda	9925283883	Jalaram colony, Porbandar	03
11	Nayan Thanki	7359151954	“Ramakant”, Narsang Tekri Society, Porbandar	03
12	Vikrantsinh Rana	8866218382	33, HW Colony, Kadiya plot, Porbandar	03
13	Chirag Tank	9925183883	“Darshan”, Jalaram Colony, Porbandar	04
14	Nitin Makvana	7874127507	At Khijdiya, Dist: Jamnagar	04
15	Jaydeep Kantbamna	7600602601	2, Gopnath Plot, St no 2, “Bharat”, Porbandar	04
16	Mahendra Modi	9408576415	Ramnivas, Jubelli plot, At Bokhita, Porbandar	04
17	Kamlesh Kotecha	9429158676	1, Bhojeshwar plot, B/h Bhaveswar temple, Porbandar	04

Acknowledgment

We are very thankful to Dr. Narottam Sahoo, Adviser and Member Secretary, Gujarat Council on Science and Technology (GUJCOST), Govt. of Gujarat. Shashtri Swami Bhanuprakasdasji, Director, SSDCSC understands the importance of the environment education and conservation related program and arranged kits for participants, identification guides, seminar arrangement, Food and Lodging facilities for birders of Jamnagar. On behalf of all the participating agencies and birders, I express my gratitude to Swamiji.

AWC Porbandar 2015 conducted in different wetlands of Porbandar has produced very fruitful results. But, this success belongs to the participating agencies like GUJCOST, SSDCSC, Porbandar Forest Division- Porbandar, Indian Coastguard- Porbandar, Green Wildlife Conservation Society and Mokarsagar Wetland Conservation Committee as well as participating experts, photographers and assistants from Jamnagar and Porbandar districts.

Our sincere thanks to Dr. Taej Mundkur, Programme Manager-Flyways, Wetland International as well as Mr. Ritesh Kumar, Conservation Programme Manager, Dr. Anita Chakraborty, Technical Officer and Mr. Akoijam Yaiphaba Meetei, Research Assistant of Wetland International- South Asia for technical support whenever needed.

AWC was completed in one day but it required months of planning. For that we must not forget the continuous support from the founding members of Mokarsagar Wetland Conservation Committee, Mr. Kishor Joshi, Mr. Bhaskar Thankey as well as Dr. Bhavbhuti Parasharya, Gujarat state co-ordinator, AWC.

AWC took hundreds of phone calls with Mr. Kishore Joshi once he mentioned the contribution of Late Darbar Saheb Shri Shivrajkumar Khachar when he supported the campaign of people of Porbandar for recognition of Chhaya Rann as a bird sanctuary in 1983. Our sincere gratitude to Late Darbar Saheb Shri Shivrajkumar Khachar. Dr. Taej Mundkur was a Research Scholar of Saurashtra University in that time. He visited wetlands of Porbandar and contributed a lot in their recognition. He also supported AWC in 1980s.

We must thank Mr. Lalit Parmarji, DCF, Porbandar Forest Division- Porbandar for giving many opportunities including “Birds of Gosabara” and “Birds of Porbandar” coffee table books (former one was presented to Smt. Anandiben Patel, Chief Minister, Gujarat), “Birds of Porbandar” photo exhibition to different schools, wildlife week 2014, birdwatching with many dignitaries and wetland education to many guides, guards, foresters and rangers of Gujarat, Assam, Punjab, Jammu & Kashmir, and Haryana. We are very grateful for showing faith in us.

Many thanks to Mr. Bhaskar Thankey, a retired tax consultant with Canada Revenue Agency who is an enthusiastic wildlife photographer and owns a farm house near Kuchhadi wetland. He remains vigilante for birds and health of Kuchhadi wetland during his 4 months stay at Kuchhadi. He also hosts the delegations who visit Porbandar for wildlife conservation.

We are very grateful to the birders who joined us from Jamnagar district i.e. Mr. Jaypalsinh Jadeja, Mr. Asraf Ali and Mr. Nitin Makvana. AWC required many equipments and devices like Cameras, Binoculars, and Scope as well as vehicles, many thanks to Shri Lalit Parmarji, IG Rajesh Makvanaji Indian Coastguard- Porbandar, Mr. Jaypalsinh Jadeja, Dr. Kamlesh Mehta, Mr. Punit Kariya, Mr. Vikrantsinh Rana, Mr. Paresh Pitroda, Mr. Nayan Thanki, Mr. Vijay Jethva, Mr. Ashraf Ali for their expensive gadgets and vehicles.

I extend my heartfelt thanks to Mr. Chirag Tank and Mr. Vivek Bhatt for assisting in filling site forms as well as constant and encouraging support during AWC. I am also very thankful to Mahendra Modi, Kamlesh Kotecha, Karan Karavdra, Jaydeep Kantbamna, Jagdish Thanki and Vijay Jethva for assisting the AWC. I hope it was a great learning learning experience for one and all.



Dhaval Vargiya,
Science Co-ordinator,
SSDCSC- Porbandar

Lalit J. Parmar
Deputy Conservator of Forests
Porbandar Forest Division,
Porbandar

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1. About Gujarat Council on Science and Technology, Gandhinagar

The Gujarat Council on Science and Technology (GUJCOST) was established in September, 1986, to play a catalytic role in promoting the use of Science and Technology in the development process of the State. The S&T Council was constituted with a view to develop technologies appropriate to and in harmony with present conditions. The Council has been catalyzing interaction between developers and users of technologies, by bringing on a common platform to training Scientists and Engineers on the one hand and policy makers as administrators.

Accordingly, the State Council is identifying the areas in which Science and Technology can be applied for development activities and achieve the goals of the State, with a particular emphasis to eliminate the prevailing backwardness, rural unemployment and poverty. It was also felt necessary to establish effective Communication and other links between, and Co-ordinate the activities of centres of Scientific and Technological Research, Government agencies and industries in order to promote the application of Science and Technology in the State.

The Council is an autonomous body registered under the Societies Registration Act from 1st February, 2000 and working under department of Science & Technology. Hon'ble Minister of Education is the Chairman of the Council. The Administration and Management affairs of the state Council is inducted by the Governing Board. The Board has constituted Executive Committee for fast Execution of work. The day to day affairs and administration of the State Council is looked after by its Advisor who is also Member Secretary of the Council. Presently GUJCOST is working at B/7, M.S. Building, Sector-11, Gandhinagar.

GUJCOST aims to encourage R & D activities in various sectors by monitoring the development and by feeding available information to assess and recommend financial support for such efforts. It also aims to devise policy guidelines for academic and field policies for the purpose of strengthening the planning and programming amenities for the development of science and technology.

2. About Shree Sahajanand Swami District Community Science Centre (SSDCSC)- Porbandar

SSDCSC is affiliated and recognized with the Gujarat Council on Science and Technology (GUJCOST), Government of Gujarat, Gandhinagar. It is established in 2004-05 by Shree Satsang Shiksha Parishad, Shree Swaminarayan Gurukul, Chhaya Main Road, Porbandar. It functions in close collaboration with GUJCOST, Government of Gujarat and is recognized as District Community Science Centre covering entire Porbandar district. The name itself is self-explanatory; The Community Science Centre is for every member of society. It aims to address total section of the society, irrespective of caste, creed, religion, sex, educational or social - economic level, urban or rural back ground or district. It is yours & for you, it is for all those who are interested in knowing about any aspect of any branch of science especially environment. It is for those who are curious and interested to gain or spread the knowledge of science in society.

SSDCSC aims to promote dissemination of knowledge in science and technology to our urban and rural children, in an entertaining manner and popularize science by creating an environment where they can pursue participatory learning. The Centre promotes the spirit of inquiry and experimentation among the younger generation and more over enlightens the society of our scientific heritage. SSDCSC arranges more than 200 programmes annually. Out of which most of programmes are nature related.

Contact Details:

Mr. Dhaval Vargiya,
Science Co-ordinator,
Shree Sahajanand Swami District Community Science Centre,
Swaminarayan Gurukul,
Chhaya Main Road,
Porbandar- 360575
Mobile: 9824822855
Email: dvargiya@yahoo.in

3. About Green Wildlife Conservation Society (GWCS)

Green Wildlife Conservation Society (GWCS) – a conservation-driven organization - has been promoting wildlife conservation and nature education. The society was started by two snake rescuers of Porbandar i.e. Mr. Chirag Tank and Mr. Paresh Pitroda. The Society aims to improve rural livelihood through wildlife rescue especially snake rescue operations throughout Porbandar district of Gujarat. GWCS works with Forest Department, Mokarsagar wetland conservation committee, and Shree Sahajanand Swami District Community Science Centre (SSDCSC)- Porbandar, recognised by Gujarat Council on Science & Technology (GUJCOST). GWCS is a large and experienced wildlife rescue group in the Surkhabinagri of Gujarat i.e. Porbandar. Our rescuers are all unpaid volunteers.

We cover entire Porbandar district. GWCS's primary aim is to rescue and rehabilitate injured and orphaned native wildlife to eventually release them back to the wild or at Porbandar bird sanctuary for treatment. We educate the public as to the issues confronting local wildlife, and do whatever we can to help maintain an environment that allows our unique wildlife to survive and enrich our lives.

Contact Details:

Mr. Chirag Tank, Founder- President,
“Darshan”
210-12, Jalaram colony, Porbandar
Email: chiragtank78@gmail.com
Mobile: 09925183883

4. About Mokar Sagar Wetland Conservation Committee

Mokar Sagar Wetland Conservation Committee is a registered NGO, which aims to recognise Mokarsagar wetland complex of Porbandar as a Ramsar site. The Strategic goal of the Mokar Sagar wetland conservation committee is to develop a comprehensive management framework for Porbandar's Wetlands of International Importance. The primary goal of the management framework is to maintain the ecological character of Mokar Sagar through conservation and wise use.

The Mokarsagar is located in a Porbandar district of the Gujarat state of India. The Mokarsagar wetland complex is a group of wetlands from Porbandar to Gosa bara, Gosa bara to Mokar and Mokar to Amipur dam. There are two entrances to the site. One from Coastal Highway at Gosabara village, from where the wetland is just one km far. Another from Mokar village from National highway 8B, from where the wetland is hardly 10 km far away.

Considering the distance from the highways, the Mokarsagar can serve as the ideal birding spot for the birdwatchers and bird photographers which may ultimately lead to livelihood improvement of EcoGuides. Mokar Sagar has potentials to open new avenues for Ecotourism and birdwatching like Keoladeo Ghana, Rajasthan and Chilka, Orissa.

Contact Details:

“Deepak-Jyoti”
Satyanarayan temple road,
Porbandar- 360575
<http://mokarsagar.org>
Email: dvargiya@yahoo.in
Mobile: 09824822855

5. Wetlands of Porbandar

A number of wetlands, both perennial and seasonal, are present in the Porbandar region. It has been observed that whenever there is a drought in this region, all the native as well as migratory birds get distributed in these satellite wetlands. With the frequency of drought years increasing it has become all the more important to increase the level of protection to the satellite wetlands. Satellite wetlands of high significance value to both migratory and resident water birds owing to its fully protected area status serves as a large staging, moulting and roosting grounds besides being foraging sites for many of water bird species. However, since Porbandar Bird Sanctuary is only *ca* 9.33ha in area, waterfowls have to largely meet their food requirements from aquatic habitats scattered around it. Many of these wetlands hold high conservation value for several water bird species, both migratory and resident by providing them wintering, staging and roosting grounds. The entire landscape with scattered wetland islands which are connected through flyways can be looked at from the point of ‘Theory of Island Bio-geography’. The basic premise of this theory is that the number of species occurring on an island represents a dynamic balance between recurrent immigration and recurrent extinction of resident species. Porbandar is an administrative district of Gujarat located in the western part of the state with its head quarters located at Porbandar town. Porbandar was carved out of Junagadh district. There are some worth visiting wetland sites in and around Porbandar. Total 226 wetlands are mapped including 95 small wetlands (<2.25 ha) with 22199 ha area. Inland wetlands contribute 27.3% of the total wetland area and coastal wetlands contribute 72.7% of the total wetland area. Major wetland categories of the district are Lagoons, Rivers/streams, Reservoirs and Sand/beach. Area under aquatic vegetation in post-monsoon is about 5451 ha. Open water spread of the wetlands is significantly higher in post monsoon (13390 ha) than during pre monsoon (7376 ha). Major portion of the open water area is under low turbidity during both seasons.

5.1. Mokarsagar (AWC 2015 count 94,204)

The Mokarsagar is located in a Porbandar district of the Gujarat state of India. The Mokarsagar wetland complex is a group of wetlands from Porbandar to Gosa bara, Gosa bara to Mokar and Mokar to Amipur dam. There are two entrances to the site. One from Coastal Highway at Gosabara village, from where the wetland is just one km far and another from Mokar village from National highway 8B, from where the wetland is hardly 10 km far away. Considering the distance from the highways, the Mokarsagar can serve as the ideal birding spot for the birdwatchers and bird photographers which may ultimately lead to livelihood improvement of EcoGuides. Mokar Sagar has potentials to open new avenues for Ecotourism and birdwatching like Keoladeo Ghana, Rajasthan and Chilka, Orissa.



5.2. Mendha creek (AWC Porbandar count 41,545)

The Mendha creek is located in a Porbandar and Devbhumi Dwarka districts of the Gujarat state of India. The Mendha creek can be reached from Porbandar- Dwarka Highway and it is 40 km. far from Porbandar city. Brackish water of Mendha creek irrigation project and Arabian ocean invites many birds. Thousands of flamingos can be sighted here. Many times juvenile flamingos are spotted in around Porbandar so Mendha creek is believed to be another nesting site for flamingos but, yet it is not scientifically proved. More than 21000 common coots were found during AWC 2015 which is the largest congregation of common coots in Porbandar region.



5.3. Chhaya rann (AWC Porbandar Count 19,540)

The Chhaya rann is located within Porbandar city itself. The Chhaya rann contains rain water, sewage water and waste discharge of Birla factory. Since 1960s, flamingos are being sighted here. This is the only site where flamingos have play-nested in past. More than 100 mud nests were created but, the soil is not sticky enough as that of Rann of Kutch so it could not hold one foot long mud pile (nest of flamingo) and nesting failed in Chhaya rann. On 29th July-2014, Lesser flamingos attempted mating. This spectacular event was photographed by Mr. Dhaval Vargiya. It is the only digital record of mating of flamingos from Porbandar region. No threats to birds from humans except feral dogs who regularly feed on injured flamingos.



5.4. Bardasagar (AWC Porbandar 2015 count 16,224)

The Bardasagar is located in the Porbandar district. The Bardasagar dam is created to store rain water for agricultural purpose. The Bardasagar dam and farms on its periphery are the ideal winter escape for thousands of cranes i.e. Common crane and Demoiselle crane. More than 15000 Demoiselle cranes were recorded during AWC Porbandar 2015. Last year, 5-6 Sarus cranes were also seen by an amateur birder. Sarus crane also nested here in 1998. Bardasagar is regular nesting ground for elegant Great crested Grebe like Mokarsagar. The “weed ceremony” and dancing ritual of Great crested Grebe can be seen here too. Change in the cropping pattern and excessive use of pesticides can be lethal to cranes.



5.5. Subhashnagar (AWC Porbandar 2015 count 4213)

The Subhashnagar is located within Porbandar city itself. The Subhashnagar contains tidal water and waste discharge of fishing industries. Almost all the species of Gulls and Terns can be sighted here in different plumages. This is the only site in the Porbandar with four to five km long Mangrove stretch which is ideal to enjoy murmuration of Rosy starlings in the evening. Mangroves are also equally important for colonial birds like cormorants, egrets, herons and storks. This is the third mouth where Mokarsagar meets the Arabian Ocean via Karly I and Karly II. Many times very dark Western reef heron is sighted which could be due to industrial waste. Feral dogs are alarming threat to the birds. Community conserved wetlands with corporate social responsibility should be implemented here.



5.6. Kuchhadi- Javar (AWC Porbandar 2015 count 11554)

The Kuchhadi wetland is located 13 km far from Porbandar city towards Dwarka Highway. Kuchhadi and Javar are two different villages but share same rain dependent water filled wetland. Kuchhadi is the best place to watch fishing Pelicans like Mokarsagar. Rocky plains and scrubs of the kuchhadi are favourite nesting grounds for larks, lapwings, coursers, stone plover and stone curlew. The private salt-pans of Javar are very important for Greater Flamingos and Gulls. Aggregations of egrets, herons, gulls and terns can be seen at pumping stations of salt pans. One watch tower has been constructed in 2006. Expansion of wind mill industry straight to the heart of Kuchhadi could be the dead end of wetland though measures are being taken by Forest Department and District Collector.



5.7. Porbandar bird sanctuary- PBS (AWC Porbandar 2015 count 1561)

Porbandar Bird Sanctuary is located amid the city of Porbandar flaunting the co-existence of man and nature. Spread over an area of 9 ha., this unique water dwelling, surrounded by trees was affirmed as a sanctuary in the year 1988. The splendid beauty of the place though not reflecting any emergent vegetation is enriched by the migratory birds visiting this area every year. The feathered creatures with their harmonious twitters and chirrups identify this area as a popular destination for birders. Water birds are often seen splashing in the freshwater lake while the sky touching flights of certain birds like gulls. It is easy to catch a close glimpse of the birds residing and nesting in this area.



6. History of birds in Porbandar

Birds are visiting wetlands of Porbandar since decades but, the lack of sustainable census fails us to prove this. Greater Flamingos started visiting Porbandar after 1965 and Lesser Flamingos after 1968 in a huge numbers. Lesser flamingos also attempted the nesting in Chhaya Rann of Porbandar. The site was inspected by Late Shri Lavkumar Khachar and was identified as play-nesting or foul-nesting.

In 1968, citizens of Porbandar demanded a bird sanctuary for these beautiful pink birds which are also known as Agnipankh but, no success. Later on in 1983, the campaign was supported by Late Darbar Saheb Shri Shivraj Kumar Khachar followed by Late Shri Fatehsinh Rav Gayakvad and Sir James Hancock of Royal Trust of Ornithology, UK. Shri Ranchhodbhai Shiyal, President, Porbandar Municipality and Shri Laxmanbhai Aagath, M.L.A. of that time helped a lot and as a result Porbandar bird Sanctuary born in November-1988. The demand was to protect entire Chhaya rann as a bird sanctuary for flamingos but Porbandar Bird Sanctuary was established only in 9 ha. area. and that too was filled with 4 ft deep water.

Biodiversity Conservation and Rural Livelihood Improvement (BCRLIP) team of Wildlife Division, Gir National park, Sasan-Gir along with Porbandar Forest Division, naturalists and NGO members of Porbandar prepared an updated checklist of birds of Porbandar in 2014 and recorded 261 bird species. Mokarsagar Wetland Conservation Committee prepared a checklist of waterbirds of Mokarsagar in February- 2015, which is based on confirmed sightings and recorded 129 waterbird species (the checklist is available at <http://mokarsagar.blogspot.in>).

Last year, AWC was conducted by Dr. Indra Gadhvi, Bhavnagar University and Shri Uday Vora, Rajpipla Forest Division along with the naturalists of Porbandar, Jamnagar and Bhavnagar. As per the Email of Dr. B. M. Parasharya, Gujarat State Co-ordinator, AWC, Gosa bara (Mokarsagar) and Bardasagar were studied and 1,18,975 waterbirds were recorded.

7. Introduction to AWC (Porbandar) 2015

Wetland International co-ordinates the AWC. The AWC runs parallel to other International census in Africa, Europe, and Neotropics under the umbrella of the International Waterbird Census (IWC). Every year, AWC is conducted by birdwatchers. As per the National Wetland Atlas of Gujarat, Porbandar has 226 satellite wetlands, out of which the important wetlands were studied during AWC.

Gujarat Council on Science and Technology (GUJCOST), Gandhinagar recognised and Shri Satsang Shiksha Parishad managed, Shree Sahajanand Swami District Community Science Centre (SSDCSC)- Porbandar in the collaboration with Porbandar Forest Division- Porbandar, Indian Coastguard, Porbandar, Green Wildlife Conservation Society and Mokarsagar Wetland Conservation Committee organised Asian Waterbird Census (AWC) on 1st February- 2015.

An introductory seminar was arranged on 31st January- 2015 at SSDCSC in the presence of Dr. Lalit Parmar, Deputy Conservator of Forests, Porbandar Forest Division, Porbandar. The participants were given special kit for AWC. Birds of Northern India (Gujarat Version), Notebook, Pen, Digital bird counter, and certificates were included in the kit. Mr. Dhaval Vargiya, Science Co-ordinator, Shree Sahajanand Swami District Community Science Centre presented a PowerPoint Presentation on “Wetlands of Porbandar” followed by “How to do AWC?”



8. Objectives and Rational of AWC (Porbandar)

- The number of birds visiting any wetland is very important. It indicates the health of a wetland and highlights seasonal change in the bird count.
- International recognition of any wetland requires bird count.
- To be listed as Wetlands of International Importance or ‘Ramsar sites’, wetlands must meet one or more internationally accepted criteria in relation to their zoology, botany, ecology, hydrology or limnology and importance to waterbirds. Criteria no 5 and 6 require a census.
 - Criteria 1: A representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region
 - Criteria 2: Supports vulnerable, endangered, or critically endangered species or threatened ecological communities
 - Criteria 3: Supports populations of plants and / or animal species important for maintaining the biological diversity of a particular biogeographic region
 - Criteria 4: Supports plant and / or animal species at a critical stage in their life cycle, or provides refuge during adverse conditions
 - **Criteria 5:** Regularly supports 20,000 or more waterbirds
 - **Criteria 6:** Regularly supports 1 % of the individuals in a population of one species or subspecies of waterbird
 - Criteria 7: Supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and / or populations that are representative of wetland benefits and / or values and thereby contributes to global biological diversity
 - Criteria 8: Important source of food for fishes, spawning ground, nursery and/ or migratory path on which fish stocks, either within the wetland or elsewhere depends
 - Criteria 9: Regularly supports 1% of the individuals in a population of one species or subspecies of wetland- dependent non-avian animal species

9. Methodology of AWC (Porbandar)

17 birdwatchers from Jamnagar and Porbandar have participated in AWC. These birdwatchers were grouped in four different teams and were allotted four separate routes and covered 21 sites.

9.1. Routes of AWC (Porbandar)

9.1.1. Route 1: (5 sites)

- 9.1.1.1. Coastal line (3 sites)
- 9.1.1.2. Amipur region
- 9.1.1.3. Mokarsagar region

9.1.2. Route 2: (5 sites)

- 9.1.2.1. Kuchhadi
- 9.1.2.2. Visavada
- 9.1.2.3. Mendha creek
- 9.1.2.4. Lamba (2 sites)

9.1.3. Route 3: (4 sites)

- 9.1.3.1. Porbandar Bird Sanctuary
- 9.1.3.2. Javar
- 9.1.3.3. Subhashnagar
- 9.1.3.4. Bardasagar

9.1.4. Route 4: (7 sites)

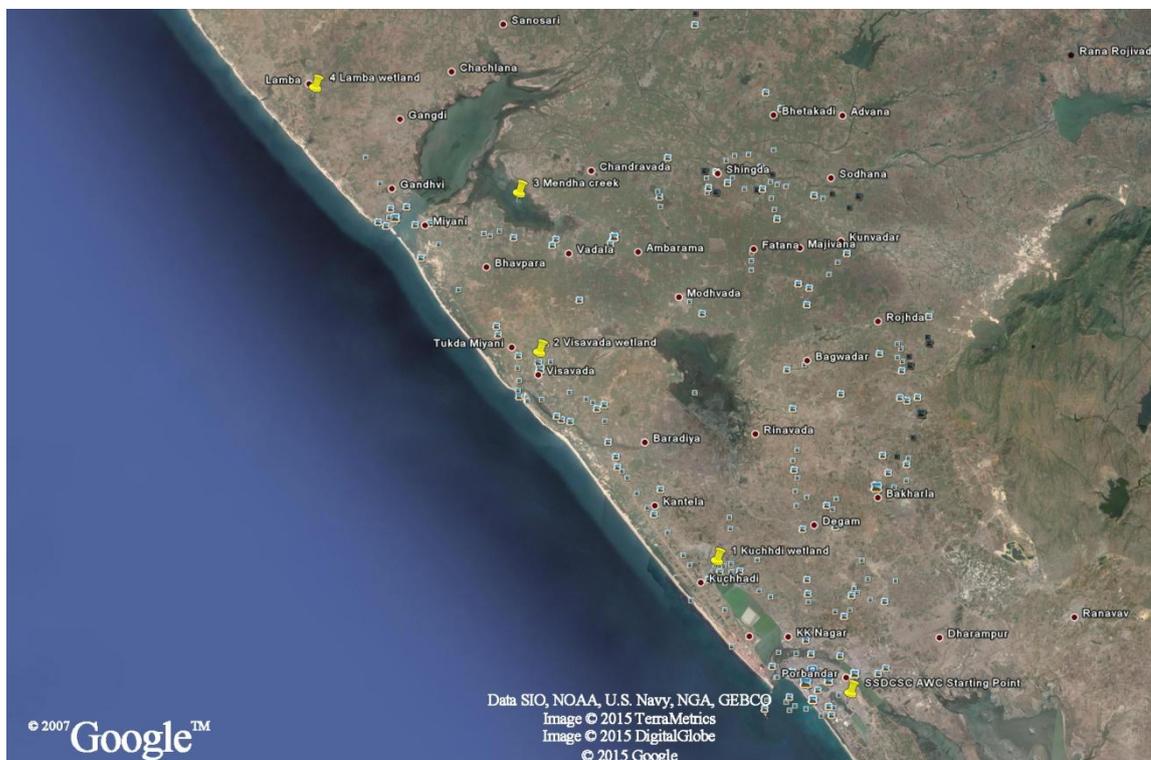
- 9.1.4.1. Chhaya (3 sites)
- 9.1.4.2. Karly (2 sites)
- 9.1.4.3. Dharampur
- 9.1.4.4. Vanana

9.2. Google maps of the routes

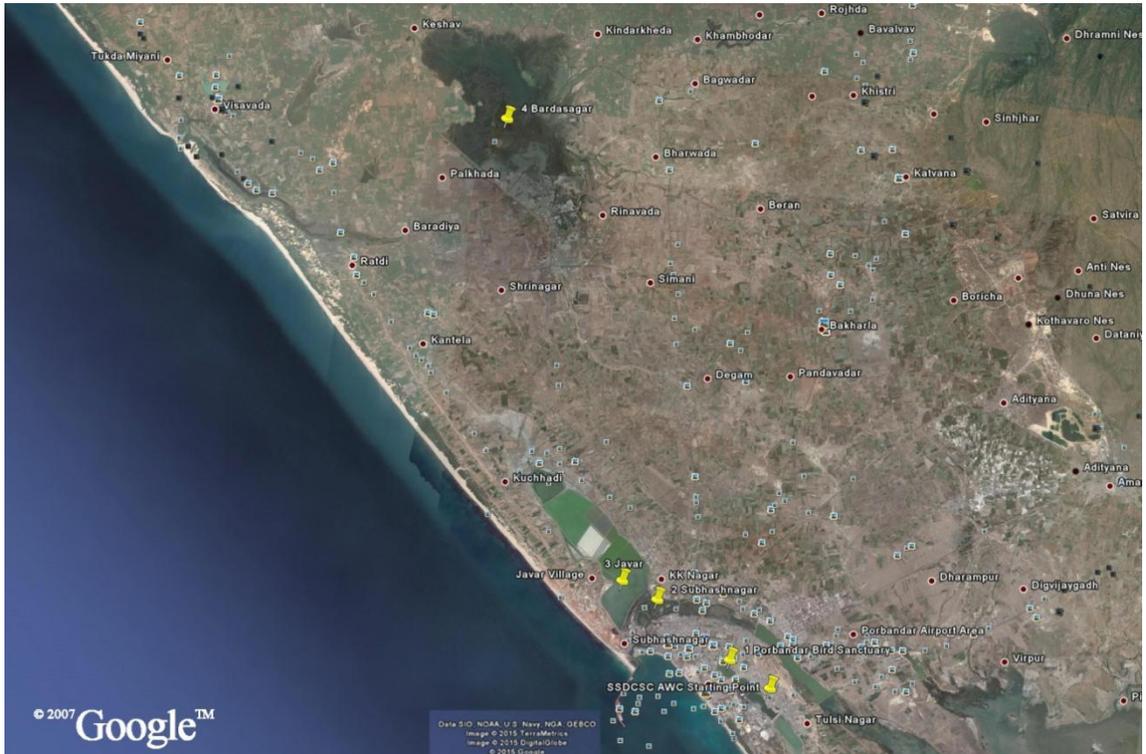
9.2.1. Route 1



9.2.2. Route 2



9.2.3. Route 3



9.2.4. Route 4



AWC was conducted by birdwatchers on above mentioned sites and routes on 1st February- 2015. 2nd February-2015 is known as World Wetland Day. Mr. Dhaval Vargiya, Science Co-ordinator and Mr. Viek Bhatt, Science Communicator, Shree Sahajanand Swami District Community Science Centre, visited Shree Madressa Boys School and explained importance of wetland and threats to wetland with PowerPoint presentation on world wetland day i.e. 2nd February-2015.

Team on a particular route was selected on the basis of the talent and expertise of birdwatchers. Due care was taken that each team receives at least one photographer, one expert and one or two assistants. During a day, birds migrate from one wetland to another. So there are chances that a flock of a bird may be counted twice which generates non-reliable data. So, to avoid such problems, all the sites were studied on a single day and all together.

10. AWC 2015 Porbandar Datasheet (Table 2)

No.	Bird species	Mendha Creek	Mokarsagar	Lamba	Visavada	Kuchhadi	Javar	Subhashnagar	PBS	Bardasagar	Chhaya	Total
1 GREBES – Podicipedidae												
1	Great Crested Grebe <i>Podiceps cristatus</i>	0	19	0	0	0	0	0	0	0	0	19
2	Little Grebe <i>P. ruficollis</i>	3	533	0	0	0	0	0	70	8	25	639
2 PELICANS –Pelicanidae												
3	Great White Pelican <i>Pelecanus onocrotalus</i>	680	2543	0	0	98	70	0	0	140	0	3531
4	Dalmatian Pelican <i>P. philippensis crispus</i>	13	182	0	0	14	31	0	2	0	0	242
3 CORMORANTS/DARTER - Phalacrocoracidae (Phalacrocoracidae & Anhingidae)												
5	Great Cormorant <i>Phalacrocorax carbo</i>	0	0	0	0	0	0	0	0	0	0	0
6	Indian Cormorant <i>P. fuscicollis</i>	0	1188	0	0	0	0	0	0	0	0	1188
7	Little Cormorant <i>P. niger</i>	730	681	0	30	0	12	0	10	63	0	1526
8	Oriental Darter <i>Anhinga melanogaster</i>	0	24	0	5	0	0	0	0	0	0	29
4 HERONS, EGRETS, BITTERNS – Ardeidae												
9	Grey Heron <i>Ardea cinerea</i>	0	75	0	1	0	50	45	2	0	0	173
10	Purple Heron <i>A. Purpurea</i>	1	97	0	0	0	0	0	0	0	0	98
11	Black-crowned Night Heron	0	0	0	0	0	0	0	0	0	0	0

	<i>Nycticorax nycticorax</i>											
12	Indian Pond Heron <i>Ardeola grayii</i>	1	260	0	6	0	30	30	30	38	3	398
13	Little Heron <i>Butorides striatus</i>	0	0	0	0	0	0	0	0	0	0	0
14	Western Reef Egret <i>Egretta gularis</i>	3	203	0	0	0	400	110	3	8	1	725
15	Great Egret <i>Ardea alba</i>	0	323	0	1	1	0	0	25	33	0	578
16	Intermediate Egret <i>Egretta intermedia</i>	0	124	0	0	0	2	0	24	0	0	150
17	Little Egret <i>Egretta garzetta</i>	3	479	2	5	0	0	0	18	0	0	507
18	Cattle Egret <i>Bubulcus ibis</i>	0	338	0	0	0	860	800	45	35	8	2086
19	Yellow Bittern <i>Ixobrychus sinensis</i>	0	0	0	0	0	0	0	0	0	0	0
20	Great Bittern <i>Botaurus stellaris</i>	0	0	0	0	0	0	0	0	0	0	0
5 STORKS – Ciconiidae												
21	Painted Stork <i>Mycteria leucocephala</i>	2	187	0	2	0	0	25	0	20	0	236
22	Woolly-necked Stork <i>Ciconia episcopus</i>	0	4	0	0	0	1	0	0	0	0	5
23	Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	0	0	0	0	0	0	0	0	0	0	0
24	White Stork <i>Ciconia ciconia</i>	0	0	0	0	0	0	0	0	0	0	0
25	Black Stork <i>Ciconia nigra</i>	0	0	0	0	0	0	0	0	0	0	0

26	Asian Openbill <i>Anastomus oscitans</i>	0	33	0	0	0	0	0	0	8	0	41
6 IBISES & SPOONBILL – Threskiornithidae												
27	Oriental white Ibis <i>Threskiornis aethiopicus</i>	0	266	0	0	0	38	0	50	0	15	369
28	Black Ibis <i>Pseudibis papillosa</i>	0	110	17	11	0	1	0	0	14	1	154
29	Glossy Ibis <i>Plegadis falcinellus</i>	1	273	0	0	0	4	0	2	1	19	300
30	Eurasian Spoonbill <i>Platalea leucorodia</i>	0	234	0	0	6	0	0	0	0	0	240
7 FLAMINGOS – Phoenicopteridae												
31	Greater Flamingo <i>Phoenicopterus roseus</i>	255	8293	0	0	0	538	0	0	15	37	9138
32	Lesser Flamingo <i>Phoenicopterus minor</i>	15000	4270	1	0	580	128	0	15	5	14634	34633
8 DUCKS & GEESE – Anatidae (Anatidae & Dendrocygnidae)												
33	Greylag Goose <i>Anser anser</i>	0	40	0	0	0	0	0	0	0	0	40
34	Bar-headed Goose <i>Anser indicus</i>	0	0	0	0	0	0	0	0	0	0	0
35	Lesser Whistling-duck <i>Dendrocygna javanica</i>	0	0	0	0	0	0	0	16	11	0	27
36	Brahminy Shelduck <i>Tadorna ferruginea</i>	0	63	0	0	0	0	0	0	4	0	67
37	Northern Pintail <i>Anas acuta</i>	0	1419	2	0	6	52	0	2	0	184	1665
38	Common Teal <i>A. crecca</i>	96	1250	0	0	26	0	0	0	27	130	1529

39	Spot-billed Duck <i>A. poecilorhyncha</i>	0	111	0	7	1	0	0	51	0	6	176
40	Mallard <i>A. platyrhynchos</i>	0	22	0	0	0	0	0	0	0	0	22
41	Gadwall <i>A. strepera</i>	0	337	0	0	0	0	0	0	2	0	339
42	Eurasian Wigeon <i>A. penelope</i>	0	671	0	0	4	0	0	0	0	0	675
43	Garganey <i>A. querquedula</i>	15	234	0	0	0	0	0	5	13	0	267
44	Marbled Duck <i>Marmaronetta angustirostris</i>	0	0	0	0	0	0	0	0	0	0	0
45	Northern Shoveller <i>A. clypeata</i>	128	7020	0	0	15	100	0	750	300	2542	10855
46	Common Pochard <i>Aythya ferina</i>	0	61	0	0	0	0	0	7	7	8	83
47	Ferruginous Pochard <i>Aythya nyroca</i>	0	2	0	0	0	0	0	0	0	0	2
48	Cotton Pigmy- Goose <i>Nettapus coromandelianus</i>	0	0	0	0	0	0	0	0	0	0	0
49	Comb Duck <i>Sarkidiomis melanotos</i>	0	30	0	0	0	0	0	2	0	0	32
9 CRANES – Gruidae												
50	Common Crane <i>Grus grus</i>	0	82	19	72	17	0	0	11	110	0	311
51	Demoiselle Crane <i>Anthropoides virgo</i>	70	33446	4000	270	1040	0	0	7	15000	0	53833
52	Sarus Crane <i>Grus antigone</i>	0	0	0	0	0	0	0	0	0	0	0

10 RAILS, CRAKES, WATERHEN, COOTS – Rallidae												
53	White breasted Waterhen <i>A.phoenicurus</i>	0	33	0	0	0	0	0	8	0	0	41
54	Watercock <i>Gallicrex cinerea</i>	0	0	0	0	0	0	0	0	0	0	0
55	Common Moorhen <i>Gallinula chloropus</i>	0	85	0	3	0	0	0	5	0	0	93
56	Purple Swamphen <i>Porphyrio porphyrio</i>	0	1115	0	0	0	0	0	1	0	3	1119
57	Common Coot <i>Fulica atra</i>	21000	7010	0	0	4	0	0	45	283	55	28397
11 JACANAS – Jacanidae												
58	Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	3	16	0	0	0	0	0	0	0	0	19
12 PAINTED SNIPE – Rostratulidae												
59	Greater Painted Snipe <i>Rostratula enghalensis</i>	0	5	0	0	0	0	0	0	0	0	5
14 STILT, AVOCET – Recurvirostridae (Charadriidae)												
60	Black-winged Stilt <i>Himantopus himantopus</i>	0	333	0	7	7	523	150	50	40	190	1300
61	Pied Avocet <i>Recurvirostra avocetta</i>	0	75	0	0	82	2	0	0	20	78	257
15 STONE CURLEW- Burhinidae												
62	Indian Thick-knee <i>Burhinus oediconemus</i>	0	0	0	0	0	0	0	0	0	0	0
16 KNEES – Burhinidae												
63	Great Thick-knee	0	13	0	0	0	0	0	0	0	0	13

	<i>B. Magnirostris recurvirostris</i>											
17 COURSER & PRATINCOLES- Glareolidae												
64	Oriental Pratincole <i>G.p.maldiviarum</i>	0	0	0	0	0	0	0	0	0	0	0
65	Indian Curser <i>Cursorius coromandelicus</i>	0	0	0	0	0	0	0	0	0	0	0
18 WADERS-Plovers, Lapwings, Sandpipers, Snipes, Godwits, Curlews, Phalaropes etc. –Charadriidae (Charadriidae & Scolopacidae)												
66	White-tailed Lapwing <i>Vanellus leucurus</i>	0	13	0	0	0	0	0	0	0	0	13
67	Sociable Lapwing <i>V. gregarious</i>	0	0	0	0	0	0	0	0	0	0	0
68	Red-wattled Lapwing <i>V. indicus</i>	0	354	14	18	9	60	50	48	58	111	722
69	Yellow-wattled Lapwing <i>V. Malabaicus</i>	0	7	0	0	0	0	0	0	0	0	7
70	Pacific Golden Plover <i>Pluvialis fulva</i>	0	0	0	0	0	0	0	0	0	2	2
71	Grey Plover <i>P. squatarola</i>	0	24	0	0	0	0	0	0	0	0	24
72	Common Ringed Plover <i>C. Hiaticuln</i>	0	10	0	0	0	0	0	0	0	0	0
73	Little Ringed Plover <i>C. dubius</i>	0	50	0	0	0	0	0	0	0	1	51
74	Kentish Plover <i>C. alexandrinus</i>	0	39	0	0	538	0	0	0	0	11	588
75	Eurasian Curlew <i>N. arquata</i>	0	0	0	0	0	0	0	0	0	0	0
76	Black-tailed Godwit <i>Limosa limosa</i>	3000	3118	0	0	17	19	0	0	0	45	6199
77	Bar-tailed Godwit	0	0	0	0	0	0	0	0	0	0	0

	<i>Limosa lapponica</i>											
78	Spotted Redshank <i>Tringa erythropus</i>	0	20	0	0	0	0	1	0	0	0	21
79	Common Redshank <i>T. tetanus</i>	0	493	0	0	3	16	31	2	0	9	554
80	Marsh Sandpiper <i>T. stagnatilis</i>	0	98	0	0	0	0	0	0	0	241	339
81	Common Greenshank <i>T. nebularia</i>	0	14	0	0	0	0	0	0	0	6	20
82	Wood Sandpiper <i>T. glareola</i>	0	42	0	0	0	4	0	0	0	1	43
83	Terek Sandpiper <i>T. terek</i>	0	0	0	0	0	0	0	0	0	6	6
84	Common Sandpiper <i>T. hypoleucos</i>	0	240	0	1	0	23	50	7	0	16	337
85	Ruddy Turnstone <i>Arenaria interpres</i>	0	0	0	0	0	0	0	0	0	0	0
86	Common Snipe <i>G. gallinago</i>	0	4	0	0	1	0	0	1	0	0	6
87	Pintail Snipe <i>G. stenura</i>	1	0	0	0	0	0	0	0	0	0	1
88	Little Stint <i>C. minuta</i>	0	450	0	0	31	0	0	0	0	119	600
89	Temminck's Stint <i>C. temminckii</i>	0	38	0	0	0	0	0	0	0	0	38
90	Dunlin <i>C. alpine</i>	0	10	0	0	0	0	0	0	0	0	10
91	Curlew- Sandpiper <i>C. testacea</i>	0	11	0	0	0	0	0	0	0	0	11
92	Broad-billed Sandpiper <i>Limicola falcinellus</i>	0	0	0	0	0	0	0	0	0	0	0
93	Ruff	0	198	0	1	2	0	0	0	0	177	378

	<i>Philomachus pugnax</i>											
94	Red-necked Phalarope <i>Phalaropus lobatus</i>	0	0	0	0	0	0	0	0	0	1	1
95	Greater Sand Plover <i>C. leschenaultii</i>	0	40	0	0	0	0	0	0	0	0	40
96	Whimbrel <i>Numenius phaeopus</i>	0	5	0	0	0	0	0	0	0	0	5
97	Unidentified waders	0	300	0	0	0	0	0	0	0	0	300
19 GULLS & TERNS-Laridae												
98	Yellow-legged Gull <i>L. Argentatus</i>	0	540	0	0	0	0	0	0	0	0	540
99	Heuglin's Gull <i>L. argentatus</i>	0	0	0	0	0	0	0	0	0	0	0
100	Pallas's Gull <i>L. ichthyaetus</i>	2	30	14	0	2	0	86	0	0	0	134
101	Brown-headed Gull <i>L. brunnicephalus</i>	1	327	100	0	0	2800	1500	120	0	20	4868
102	Black-headed Gull <i>L. ridibundus</i>	0	3110	207	0	0	1200	1200	30	0	818	6565
103	Slender-billed Gull <i>L. genei</i>	30	40	0	0	0	103	125	0	0	0	298
104	Whiskered Tern <i>Chlidonias hybridus</i>	500	500	0	0	0	0	0	0	0	0	1000
105	Gull-billed Tern <i>Gelochelidon nilotica</i>	0	180	0	0	0	0	0	0	0	2	182
106	Caspian Tern <i>Hydroprogne cas pia</i>	1	51	0	0	0	0	0	0	7	0	59
107	River Tern <i>S. aurantia</i>	6	251	31	6	0	0	0	11	28	0	333
108	Common Tern <i>S. hirundo</i>	0	1	57	0	0	0	0	0	13	0	71
109	Little Tern	0	1	0	0	0	20	0	8	0	0	29

	<i>S. albifrons</i>											
110	Saunders's Little Tern <i>S. saundersi</i>	0	0	0	0	0	0	0	0	0	0	0
111	Lesser Crested Tern <i>S. bengalensis</i>	0	20	0	0	0	0	0	0	0	0	20
112	Sandwich Tern <i>S. Sandvicensis</i>	0	29	0	0	0	0	0	0	0	0	29
113	Unidentified Gulls	0	9000	0	0	0	691	0	13	0	0	9704
20 Water dependent Raptors- Pandionidae, Falconidae & Accipitridae												
114	Osprey <i>Pandalion haliaetus</i>	0	6	0	0	1	0	0	0	0	1	8
115	Brahminy Kite <i>Haliastur indus</i>	0	2	0	0	0	0	0	0	0	0	2
116	Peregrine falcon <i>Falco peregrines</i>	0	5	0	0	0	0	0	0	0	1	6
117	Eurasian Marsh Harrier <i>Circus spilonotus</i>	0	39	1	0	4	0	0	0	1	2	47
118	Greater Spotted Eagle <i>Aquila clanga</i>	0	2	0	0	0	0	0	0	0	0	2
21 Kingfishers- Alcedinidae, Halcyonidae & Cerylidae												
119	Small Blue Kingfisher <i>Alcedo atthis</i>	0	12	3	0	0	0	0	0	0	0	15
120	Blue eared Kingfishers <i>A. meninting</i>	0	8	0	0	0	0	0	0	0	0	8
121	White-breasted Kingfisher <i>Halcyon capensis</i>	0	35	6	3	2	2	0	0	4	0	52
122	Lesser Pied Kingfisher <i>Ceryle rudis</i>	0	20	0	0	0	0	0	0	0	0	20
22 Swallows- Hirundinidae												
123	Wire tailed Swallow <i>Hirundo smithii</i>	0	472	0	0	0	0	0	20	6	0	498

124	Red-rumped Swallow <i>H. daurica</i>	0	47	0	0	0	0	0	0	0	0	47
23 Wagtails & Pipits- Motacillinae												
125	White Wagtail <i>Motacilla alba</i>	0	39	0	0	0	0	0	0	0	1	40
126	Large Pied Wagtail <i>M. maderaspatensis</i>	0	0	0	0	0	0	0	0	0	0	0
127	Citrine Wagtail <i>M. citrela</i>	0	165	0	0	0	0	0	0	1	5	171
128	Yellow Wagtail <i>M. flava</i>	0	128	12	0	0	22	0	0	8	2	172
129	Grey Wagtail <i>M. cinerea</i>	0	0	0	0	0	0	0	0	0	0	0
		Mendha Creek	Mokarsagar	Lamba	Visavada	Kuchhadi	Javar	Subhashnagar	PBS	Bardasagar	Chhaya	Grand total
	Total	41545	94204	4056	461	2513	9041	4213	1561	16224	19540	193358

PBS: Porbandar Bird Sanctuary

11.Data Analysis

Mokarsagar is the largest wetland in Porbandar district. The approximate area of Mokarsagar is 108 sq. Km. out of which more than 90 sq. Km. remains water filled. Within the Mokarsagar, three wetland types are recognised (1) coastal brackish/saline lagoons as a part of Marine or Coastal wetland, (2) Seasonal/intermittent freshwater marshes, shrub-dominated freshwater marshes as Inland wetlands and (3) Water storage areas; reservoirs/barrages/dams/impoundments as a Human made wetland. The group of diverse wetland complex adds blossom to the diversity of Mokarsagar. Largest bird counts are obtained from Mokarsagar wetland complex during AWC Porbandar 2015. Mokarsagar is a complex of different wetlands including Gosa bara, Mokarsagar, Amipur, Bhadar bara, Ghed region, Karly I and Karly II. To cover entire region on a single route was practically impossible so Gosa bara, Mokarsagar, Amipur, Bhadar bara, Ghed region were studied in route no.1. Karly, Karly II, Dharampur and Vanana wetland were studied in route no. 4.

AWC Porbandar 2015 of different wetlands of Porbandar are as follow. Kindly note that AWC count of Mokarsagar includes the count of Gosa bara, Coastline, Amipur, Karly I, Karly II, Dharampur and Vanana. AWC count of Chhaya ran includes the count of Chhaya 1, 2 and 3.

No.	Wetland	Route	AWC count	Max. Recorded bird species	
1	Mokarsagar	1	94204	Demoiselle Crane	33468
2	Mendha Creek	2	41545	Common Coot	21000
				Lesser Flamingo	15000
3	Chhaya Rann	4	19540	Lesser Flamingo	14634
4	Bardasagar	3	16224	Demoiselle Crane	15000
5	Javar	3	9041	Gulls	4794
6	Subhashnagar	3	4213	Gulls	2911
7	Lamba	2	4056	Demoiselle Crane	4000
8	Kuchhadi	2	2513	Demoiselle Crane	1040
9	Porbandar Bird Sanctuary	3	1561	Northern Shoveler	750
10	Visavada	2	461	Demoiselle Crane	270
		Total	193358		

Table 3. AWC Porbandar 2015 site counts

12. Conclusion

AWC conducted at 21 different sites of Porbandar shows that Mokarsagar has the highest bird count i.e. 94204 followed by Mendha Creek i.e. 41545. Wikipedia shows that world famous Khichan village of Rajasthan every year hosts almost 20000 Demoiselle Cranes while 53778 Demoiselle Cranes were recorded in different wetlands of Porbandar out of which 33468 were recorded in Mokarsagar wetland complex. 21000 Common Coots all together at Mendha Creek is the largest congregation of marsh birds recorded in the district. International single species action plan for the conservation of Lesser Flamingo, 2008 describes Chhaya Rann, Birla Khadi, Javar salt pans, Kuchhadi and Gosa-Karli Tidal regulators (Mokarsagar) as key sites for Lesser Flamingo conservation.

13. Utility, Limitations & Suggestions

Gujarat State Forest Department, Wetland International and Mokarsagar Wetland Conservation Committee are trying their best to recognise Mokarsagar wetland complex as a Ramsar site i.e. a wetland of international importance. As per the internationally accepted criteria no. 5 of Ramsar Sites, a wetland should host 20000 or more birds. AWC Porbandar 2015 proves that Mokarsagar hosts almost five times birds than the required criteria i.e. 94204 waterbirds of more than 100 bird species. AWC Porbandar 2015 can speed up the process of Ramsar listing of Mokarsagar.

There are three main waterbird counting methods as per “Guidance on waterbird monitoring methodology: Field Protocol for waterbird counting” prepared by Wetland International i.e. (1) Ground Count (2) Boat Survey and (3) Aerial Survey. AWC Porbandar 2015 is totally based on ground count. Mokarsagar wetland complex is very vast area and waterbird counting through ground count is not possible in some region of Mokarsagar. Currently fishing is banned by Porbandar District Collector Office. If special permission is given for AWC through boat survey, many more waterbird species can be recorded and count may improve. Aerial surveys can also be adopted as Mokarsagar, Amipur and Mendha creek are very vast regions so the flamingos are widely spread in these region. Regular aerial surveys may reveal the discover the nesting colonies of flamingos if any.

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Asian Waterbird Census (AWC) Teams

Route 1



Photo: Karabhai Odedra

Route 2



Photo: Maheshbhai

Route 3



Photo: Nayan Thanki

Route 4



Photo: Mahendra Modi

