CONTENTS

Acronyms and Abbreviations

FO-CAP: Forest Owlet Conservation Action Plan

IBA: Important Bird & Biodiversity Areas

IISER: Indian Institute of Science Education and Research

IUCN: International Union for Conservation of Nature and Natural Resources

MoEFCC: Ministry of Environment Forest and Climate Change

NDDF: Northern Dry Deciduous Forests

NDVI: Normalized Difference Vegetation Index

NGO: Non-Governmental Organisation

NP: National Park

NTCA: National Tiger Conservation Authority

NVDDF: Narmada Valley Dry Deciduous Forests

NWGMDF: North Western Ghats Moist Deciduous Forests

PA: Protected Area

RF: Reserve Forests

SACON: Sálim Ali Centre for Ornithology and Natural History

SCP: Systematic Conservation Planning

SRF: Species Recovery Plan

TR: Tiger Reserve

UT: Union Territory

WII: Wildlife Institute of India

WLS: Wild Life Sanctuary

Executive Summary

The Forest Owlet *Athene blewitti* is endemic to India and is currently known to occur in a few pockets in the States of Maharashtra, Gujarat, Madhya Pradesh and the UT of Dadra and Nagar Haveli and Daman and Diu. The species figures in Schedule-I of the Indian Wild Life (Protection) Act, 1972 and is categorised as Endangered in the IUCN Red List. Despite several surveys and studies on the species since its rediscovery in 1997, its distribution and ecology remain unclear. Information on population size and connectivity, impact of threats on the populations, habitat connectivity are urgently required to plan its conservation.

The Forest Owlet Conservation Action Plan meeting was an outcome of a collaborative project between Sálim Ali Centre for Ornithology and Natural History (SACON) and Indian Institute for Science Education and Research (IISER) Tirupati, funded by the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India. The meeting was planned to share and consolidate collective knowledge on the ecology and conservation status of the Forest Owlet and to develop a framework document of actions to be taken to conserve the species. The overall goal of the Conservation Action Plan is to ensure a viable population of Forest Owlet and secure its habitat across its distribution range in India through collaborative actions and engagement with all stakeholders. The objectives for research, policy and outreach are as follows:

1. To generate crucial and robust information on the Forest Owlet through scientific studies on the ecology and habitat of the species and share and consolidate existing knowledge on the species for long-term conservation of the species.
2. To develop policy guidelines that would set conservation priorities and recommend management strategies at both local and landscape levels for the conservation of Forest Owlet populations in the central Indian landscape.
3. To create a network of stakeholders who would contribute towards the conservation of the species through various activities and roles and to design effective strategies for outreach for the conservation of the Forest Owlet.

Forty-six participants, including individuals from various Government and Non-Government organisations, Forest Departments of the range States of the Forest Owlet, independent researchers and funding organisations, collectively contributed towards preparing this document. The document outlines the current state of knowledge on the species, measures towards conserving the species, the threats it faces, gaps in information, policy and outreach, and outlines strategies and actions to plan its conservation over a period of 10 years.

Evaluation indicators for actions are listed, stakeholders are identified and the actors for implementing each action are listed. Benchmark scorecards with target scores to be reached for knowledge and capacity generation are prepared for the three major States (Maharashtra, Gujarat and Madhya Pradesh) that fall within the distribution range of the species. Finally, a consolidated list of priority recommendation for actions and the expected outputs are presented for each State. The estimated cost for the ten-year Plan (2021-2031) totals Rs. 25,50,00,000.00.

Introduction

The Forest Owlet *Athene blewitti*, a species endemic to India and known to occur in a few pockets within a narrow zone of latitudes (approximately 19^{o}– 22^{o} N), was first discovered in 1872, through a specimen collected from Basna, currently in the State of Chattisgarh, by FR Blewitt. The specimen was described by Hume (1873) as Forest Owlet and placed in the genus *Heteroglaux* and named after FR Blewitt. Subsequently, between 1877 and 1883, six more specimens were collected, one by V. Ball from Odisha (Udanti River, Khariar, Odisha) and four by J. Davidson from Maharashtra (West Khandesh which borders Madhya Pradesh to the north and Gujarat to the west) (Blandford 1895, Rasmussen and Collar 1998). Davidson's 1884 record was the last known for more than a century, and it was believed to be extinct until it's rediscovery in 1997 (King and Rasmussen 1998, Rasmussen and Collar 1998). Details of the history of discovery, re-discovery and fraud are detailed in Rasmussen and Collar (1998). After the re-discovery there have been several surveys and studies, some resulting in new locations and range extensions, which have been summarized in Table 1.1.

Table1.1: List of publications and reports on Forest Owlet since its re-discovery in 1997.

Publications	Locality and year of field/lab study	Topic
King and Rasmussen (1998)	Madhya Pradesh, Odisha and Maharashtra. 1997	Survey, re-discovery of Forest Owlet in Shahada forests, Maharashtra
Rasmussen and Collar (1998)	Museum specimens. 1998	Clarifications on distribution, status, morphological description
Rasmussen and Ishtiaq (1999)	Shahada Forests, Maharashtra,	First observations of vocalisations
Ishtiaq and Rahmani (2000a)	Shahada Forests, Maharashtra. 1999	Behaviour: Cronism
Ishtiaq and Rahmani (2000b)	Central Indian Forests: Maharashtra, Madhya Pradesh and Odisha. 2000	Survey, new locations, status
***Rithe (2003)	Mahendri RF, Maharashtra. 2003	New records
Ishtiaq and Rahmani (2004)	Toranmal Forest Range, Shahada, Maharashtra. 1998-1999	Behaviour and ecology: courtship and breeding, vocalisation, diet, threats
#Jathar & Rahmani (2004)	Toranmal and Taloda Forest Ranges,	Ecology and behaviour: habitat preference and utilization,

Jathar (2006): PhD thesis Jathar and Rahmani (2012)	Maharashtra. 2001-2004	breeding biology, foraging ecology, diet, breeding, predation, threats, conservation recommendations
Kasambe et al. (2004)	Melghat TR, Maharashtra. 2002 and 2003	New locations
Mehta et al. (2007): Final Report Mehta et al. (2008)	Maharashtra: 2006, Madhya Pradesh: 2005-2006, Gujarat: 2007, Odisha: 2006-2007 and Chattisgarh: 2005	Survey, new locations, threats, breeding
Rasmussen and Collar (2008)	Museum specimen	Specimen fraud
***Chavan and Rithe (2009)	Yawal WLS, Maharashtra 2004	Breeding record
Yosef et al. (2010)	Melghat TR. 2004	Notes on interactions with other species, habitat and foraging habits
Pande et al. (2011a) Jathar and Patil (2011) Pande et al. (2011b) Ishtiaq (2011) Pande et al. (2011c)	Melghat TR. 2004	Possible hybridisation between Forest Owlet and Spotted Owlet and responses
Jathar and Patil (2011)	Toranmal and Taloda RF, Maharashtra:2010 and 2011; and Khaknar, Piplod, West and East Kalibhit Forest Ranges, Madhya Pradesh: 2011	Reassessment survey, estimation of habitat loss, threats, conservation issues and strategy
***Mahajan et al. (2012)	Mahendri RF, Amravati, Maharashtra	Checklist of birds with Forest Owlet included
***Narasimmarajan and Mahato (2013)	Amravati District (Territorial Forests), Maharashtra. 2011	New location and compilation of old records
Rasmussen and Collar (2013)	Species level study	Morphology, osteology, acoustics, behaviour and taxonomy
Laad and Dagale (2014)	Tansa WLS, Maharashtra. 2014	First record from Tansa WLS
Jathar et al. (2015)	Across distribution range, field survey in Maharashtra 2014-2015	Ecological niche modelling, field surveys, new location

Mehta and Kulkarni (2015)	Khandwa Circle 2015	Capacity building workshop on protection of nest sites of Forest Owlet
Mehta et al. (2015)	Betul district, Madhya Pradesh	Survey, new location, threats, conservation recommendation
Patel et al. (2015)	Purna WLS, Gujarat. 2014	New location: First authenticated location for Gujarat
Laad et al. (2016)	Tansa WLS, Maharashtra. 2014-2016	Survey, new locations, status of habitat, threats, conservation strategies
Raha et al. 2017	Nashik District, Harsul, Maharashtra. 2016	New location
Mehta et al. (2017a)	Nandurbar District, Yawal WLS, and Tansa WLS in north-western Maharashtra. 2016	Survey, new locations, threats, conservation measures
Mehta et al. (2017b)	East Kalibhit Forests, Khandwa District, Madhya Pradesh	Survey, demography studies through colour-banding, habitat use through radio-telemetry, breeding biology, diet, outreach and awareness
Patel et al. 2017	Valsad and Navsari Districts, Gujarat. 2016	5-day survey, new locations
Mehta et al. (2018)	East Kalibhit Forests, Madhya Pradesh. 2013-2014	Diet of Forest Owlet, Spotted Owlet and Jungle Owlet, niche partitioning
Patel (2018)	Dang District, Gujarat. 2015-2016	Survey, new locations, distribution model
Mukherjee et al. (2016) Koparde et al. (2018) Koparde (2019): PhD thesis Koparde et al. (2019)	Madhya Pradesh, Gujarat and across the distribution range. 2013-2016	Molecular phylogeny, niche/distribution models-past/current, comparative biogeography, Quaternary climatic fluctuations
Anand (2019): MSc thesis	Khandwa District, Madhya Pradesh. 2018-2019	Nest site availability and selection, nest-box acceptance
Kulkarni and Mehta (2020)	Nandurbar District, Maharashtra. 2016-2017	Distribution survey, habitat selectivity
Mehta et al. (2020)	Applicable across distribution range	Manual on owl pellet analysis for diet studies

***These records are not authenticated with photographic evidence and need validation

[#] Publications from the same study are clubbed together in a single cell

Table 1.2: Current Projects

Name of organisation	Locality	Topic of study
WRCS	Madhya Pradesh and Maharashtra.	Ecology, banding, outreach
SACON and IISER Tirupati	Maharashtra, Gujarat, Madhya Pradesh	Occupancy surveys, standardising acoustic surveys, genetics, Conservation Action Plan

Distribution/niche models using NDVI (Jathar et al. 2015), a combination of climate and vegetation data (Mukherjee et al. 2016) and climatic data (Patel 2018) have predicted a wider distribution than previously reported. Model predictions were supported by new locations of presence in Tansa WLS, Maharashtra (Laad and Dagale, 2014; Laad et al. 2016) and Purna WLS, Gujarat (Patel et al. 2015–the first record for Gujarat and an additional state within the distribution range of the species). More recent reports of new locations have pushed the range distribution further west with a Forest Owlet reported from Dadra and Nagar Haveli WLS on 07 January 2021 by Saswat Mishra (https://ebird.org/india/region/IN-DN, 15 February 2021). On the other hand, surveys for presence in the eastern regions of the distribution in the States of Chattisgarh and Odisha failed to yield positive results in Mehta et al's. (2007) survey, though there have been no further surveys in the two states.

Until 2016 it was listed as Critically Endangered in the IUCN Red List but was downlisted to Endangered due to new locations and a larger population of mature individuals than earlier estimated (BirdLife International, 2018). It is listed in Schedule I of the Indian Wildlife (Protection) Act (1972). Yet, there is a paucity of information on its distribution (especially in the eastern parts of the species range), population and habitat connectivity, population size/abundance and trends, habitat requirements and a measure of threats in each locality. Several locations of presence are reported from highly fragmented and degraded landscapes and forest loss due to anthropogenic activities is identified as the largest threat to the species (Jathar and Patil 2011, Patel et al. 2015, Mehta et al. 2017 a & b, Kulkarni and Mehta 2020).

Species Account

Taxonomy

Hume (1873) described the species based on specimens collected by F. R. Blewitt. The species was placed in a new genus *Heteroglaux* owing to some of its features distinguishing it from *Athene brama* and *Athene noctua*. The genus name *Heteroglaux* translates to "a different owl" (*Hetero* = different, *glaux* = owl). The taxonomic position of the species is a matter of discussion since its description. It has been argued to be a sister taxa to *A. brama* (Wolters 1975). It is similar in appearance to the Spotted Owlet which has led to misidentifications in field, usually with Spotted Owlet being misidentified as Forest Owlet (Prachi Mehta pers. comm. 25 March 2021). Rasmussen and Collar (1998) provide comprehensive morphological descriptions of Forest and Spotted Owlets with details of differences in the appearance of the two species. Some researchers feel it should be placed within the *Athene* genus (Blanford 1895, Ali & Ripley 1983), whereas Konig et al. (1999) reported it to be closely related to *Glaucidium* members. Rasmussen and Collar (2013) placed it back in *Heteroglaux* based on an osteological study. A recent phylogenetic study (Koparde et al. 2019) reported the species to be nested within the *Athene* clade, suggesting that it is a member of the *Athene* genus. According to Koparde et al. (2019), the species likely diversified around 4.3 to 5.7 million years ago, during the Plio-Pleistocene climatic boundary. Phylogenomic studies are necessary to resolve the phylogenetic placement and understand the evolutionary history of the species.

Distribution and Habitat

The Forest Owlet is endemic to India and is currently reported from the States of Maharashtra, Madhya Pradesh, Gujarat and the UT of Dadra and Nagar Haveli and Daman and Diu. Gujarat and the UT of Dadra and Nagar Haveli and Daman and Diu are recent additions to the distributional range of the species. A detailed list of locations of Forest Owlet presence within the States is provided by BirdLife International (2018). Historically they were reported from Chattisgarh and Odisha as well, but a rapid survey by Mehta et al. (2007) did not detect the species in these two States. Due to severe insurgency in several districts of Chattisgarh and Odisha the survey was restricted in space and time (Mehta 2007). Niche models predict additional areas (especially along the Western Ghats and parts of western Madhya Pradesh bordering Gujarat and Maharashtra) and a larger range for the species than currently known, but these need to be validated through field surveys (Jathar et al. 2015, Mukherjee et al. 2016, Patel 2018). Jathar et al. (2015) have provided a list of areas in Gujarat, Maharashtra, Madhya Pradesh, Chattisgarh and Odisha which have no current records of Forest Owlet but have been

predicted as potential sites for the species from their niche models. The NDVI models of Jathar et al. (2015) and Koparde (2019) predicted the occurrence of Forest Owlet in Dadra and Nagar Haveli WLS which was validated in a recent record on 04 February 2021 by Saswat Mishra (https://ebird.org/india/checklist/S80443828, accessed on 15 February 2021). Similarly, the species presence in the Dang forests was predicted through niche models and was later validated through surveys (Jathar et al. 2015, Patel et al. 2015, Mukherjee et al. 2016, Patel 2018).

The current range of the species falls within the Champion and Seth (1968) categorisation of Tropical Moist Deciduous Teak Forests of the types 3B/C1b in Gujarat and Maharashtra and Tropical Dry Deciduous Forests 5A/C1, C1a and C1b in Madhya Pradesh. Forest Owlet locations are largely from Teak dominant mixed forests (Ishtiaq et al. 2002, Jathar and Rahmani 2004, Mehta et al. 2008, Jathar and Rahmani 2011, Mehta et al. 2015, Patel et al. 2015, Mehta et al. 2017a,&b, Patel 2018, Kulkarni and Mehta 2020). Mehta et al. (2007) mention the species preference for mixed forests and avoidance of pure Teak forests or mixed forests without Teak. The distribution range extending from the northern parts of the Western Ghats and along the Satpura mountain range, corresponds closely with the North Western Ghats Moist Deciduous Forests (NWGMDF) (IM0134) (Rawat et al. 2002a), the Narmada Valley Dry Deciduous Forests (NVDDF) (IM0207) (Rawat and Wikramanayake 2002) and the Northern Dry Deciduous Forests (NDDF) (IM0208) (Chattisgarh and Odisha) (Rawat et al. 2002a) of the Tropical and Subtropical Dry Broadleaf Biome-Indo-Malayan Ecoregion category described by Olson et al. (2001), and broadly with Rodgers and Panwar (1988) Biotic Province 6A – Deccan Central Highlands of Satpuda and Maikal Hills (Figure 2.1). Within this region the conservation of forests at the Maharashtra and Madhya Pradesh border from Melghat TR into Khandwa, Burhanpur and Betul districts is crucial for the Forest Owlet as this landscape perhaps has the largest contiguous habitat for the species (Mehta et al. 2015). Most presence locations are from elevations of 400 to 600 m (Ishtiaq and Rahmani 2000, Jathar and Rahmani 2004, Mehta et al. 2008, Jathar and Rahmani 2011, Patel et al. 2015). A recent study from Nandurbar district, Maharashtra by Kulkarni and Mehta (2020) reported sightings from a wider range of elevations (including lower elevations) between 250–550 m asl, as compared to earlier studies in the same region (400–500 m asl) (Ishtiaq and Rahmani 2000, Jathar and Rahmani 2004). The highest recorded elevation for the species is at 920 m from Narnala WLS, Maharashtra by Chavan et al. (2013) and the lowest is at 50 m in Tansa WLS by Mehta et al. (2016).

Historical records of Forest Owlet from Chattisgarh and Odisha were from areas with Moist and Dry Deciduous Forests which have Teak and Sal *Shorea robusta* as dominant species (Mehta et al. 2007, 2008, BirdLife International 2018). However, Mehta et al. (2007, 2008) reported

extensive degradation of the forests in those areas mainly due to agriculture replacing forested areas. Yet, agriculture, interspersing forest tracts, is a prominent feature of current Forest Owlet habitat (Patel et al. 2015, Patel et al. 2017, Mehta et al. 2017 a & b, Patel 2018, Kulkarni and Mehta 2020). More recently Kulkarni and Mehta (2020) report that though the Forest Owlet largely uses forests of intermediate density in Tansa WLS, Melghat TR, Betul and East Kalibhit, in the Nandurbar region it occupies more open and patchy forested areas and avoids "continuous forests". In contrast, historical records describe Forest Owlet habitat as dense forests (Hume 1873, Blandford 1895, Ali and Ripley 1969) and it is likely that current locations across most of its range along hill slopes are in suboptimal and degraded habitats (BirdLife International 2018). Mehta et al. (2008) mention a relatively contiguous tract of habitat of approximately 3000 km^2 in Melghat TR, free from logging and large-scale developmental activities. However, most sightings during their survey were from around villages and near roads but within forested areas inside the TR (Mehta et al. 2008), a pattern also reported in the Dangs region by Patel et al. (2015), Patel et al. (2017) and Patel (2018).

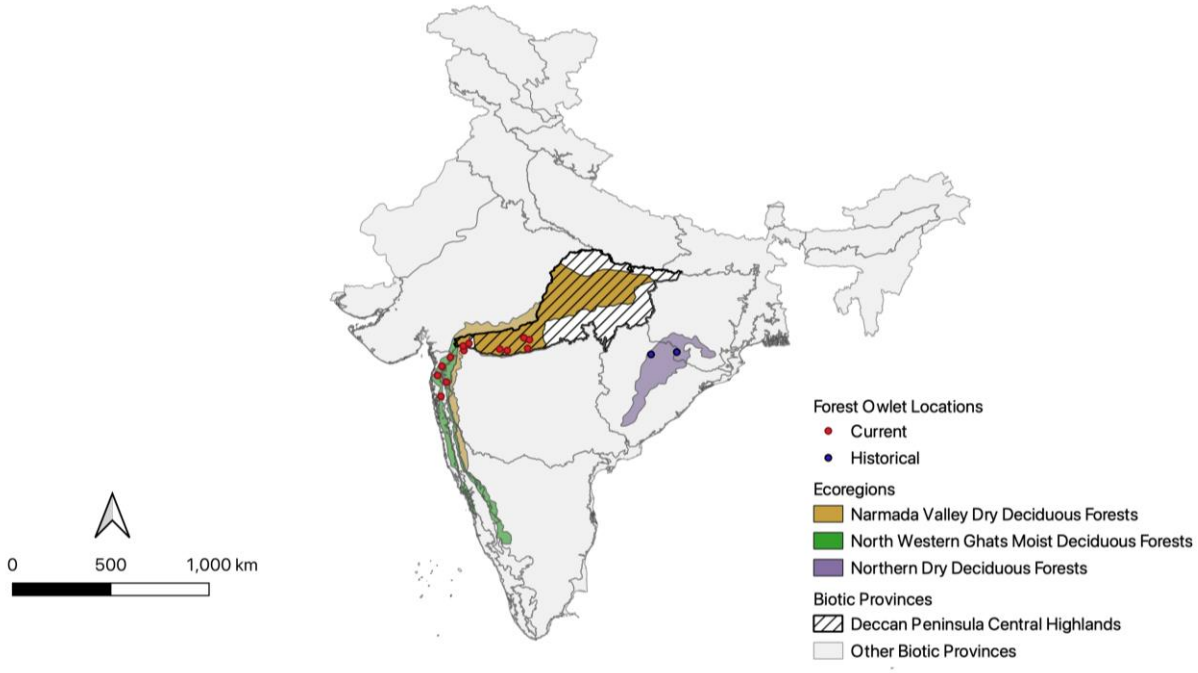

Figure 2.1: Locations harbouring Forest Owlet on a backdrop of the Biotic Provinces of India (Rodgers and Panwar 1988, Rodgers et al. 2002) and Terrestrial Ecoregions (Olson et al. 2001; https://www.worldwildlife.org/publications/terrestrial-ecoregions-of-the-world accessed on 23 Feb 2021) showing a close fit with three Ecoregions.

A synthesis of studies suggests that the current habitat of the Forest Owlet is a mosaic landscape with forests, scrub and small-scale agriculture. A study by Jathar and Rahmani (2004) revealed how these varied patches within the landscape serve different purposes for the Forest Owlet depending on the type of activity. While the overall habitat was dominated by Teak, the roosting habitat was associated with the presence of taller Teak trees, a relatively sparser canopy and at a distance from the road, the foraging habitat was structurally more open with shrub and grass cover and with shorter trees of lower girth and higher ground cover close to hamlets and agriculture. Initial results from an ongoing study using radio-tagging revealed differences in foraging habits of males and females, where the female foraged around agricultural fields while the male used forested areas (Mehta et al. 2017b, Mehta 2020a) Nesting areas were in relatively open areas that had taller trees with larger girth, and sparser canopy cover (Jathar and Rahmani 2004).

Diet

The diet of the Forest Owlet is eclectic as seen from a few studies and broadly comprises of mammals, birds, reptiles, amphibians and insects (Ishtiaq et al. 2002, Jathar and Rahmani 2004, Mehta et al. 2018). Small rodents from the *Mus* genus and insectivores from the *Suncus* genus were the predominant mammalian prey species of Forest Owlet in the East Kalibhit Forests of Khandwa District in Madhya Pradesh (Mehta et al. 2018). *Suncus* and *Mus* species were also consumed in Toranmal Reserve Forest, Nandurbar District, Maharashtra (Jathar and Rahmani 2004). A comparison with Spotted Owlet and Jungle Owlet diet in Mehta et al's. (2018) study revealed a much broader spectrum of prey taken by Forest Owlet than the other two species and a high overlap in diet between the Forest Owlet and Spotted Owlet. However, the Forest Owlet is largely diurnal and crepuscular while the Spotted Owlet is largely crepuscular and nocturnal (Ishtiaq et al. 2002, Jathar et al. 2004, Mehta et al. 2018). Jathar and Rahmani (2004) estimated the peak hunting activity to be from 0700h to 1300h.

Breeding Biology

A study in Toranmal Reserve Forest, Nandurbar District, Maharashtra from 1998 to 1999 was the first to describe courtship vocalisations and behaviour in the Forest Owlet (Ishtiaq et al. 2002, Ishtiaq and Rahmani 2005). The calls recorded during that study are currently used for surveying the species using the call-playback method especially during the breeding season, which lasts from October to May, when the birds are most responsive and vocal (Ishtiaq and Rahmani 2000a, Mehta et al. 2007, Jathar and Patil 2011, Mehta et al. 2015, BirdLife International 2018). Mating commences around November and December and the choice of

large girth and tall trees with natural cavities for nesting (Jathar and Rahmani 2004, Ishtiaq and Rahmani 2005). Nest site fidelity was also observed (Jathar and Rahmani 2004, Mehta et al 2017b) which has serious conservation implications (Mehta and Kulkarni 2015, Mehta 2020a), especially in Reserve/managed Forests. The female incubates a clutch of one to three eggs for around 29 days with hatching occurring around January (Jathar and Rahmani 2004). Nesting failure due natural predators or due to human activity was not uncommon and in such instances the pair re-nested in the same season (Jathar and Rahmani 2004). Both, the male and female participate in rearing young and while the male plays a vital role in provisioning the female during breeding, the female protects the young from predators (Jathar and Rahmani 2004, Ishtiaq and Rahmani 2005).

In an ongoing study by WRCS, 49 Forest Owlets were colour-banded in the East Kalibhit forests, Madhya Pradesh and 17 in Chourakund Range of Melghat TR and preliminary results show that the Forest Owlets are territorial during the breeding season and often reuse the same site and nest trees over years (Mehta et al. unpublished). The study also demonstrated that Forest Owlets also venture outside their territories in search of a mate or any other resource. Radio-tagging studies on 2 male and one female Forest Owlet in the East Kalibhit forests in Khandwa over a period of four months indicated that males and females differ in the extent of their home ranges and foraging sites (Mehta et al. 2017b, Mehta 2020 b & c).

Threats

Habitat degradation

Though Forest Owlet is protected under Schedule I of the Indian Wildlife (Protection) Act (1972), which affords it the highest protection, the major threat the species faces is from habitat degradation, fragmentation and destruction due to anthropogenic activities (Mehta et al. 2008, Jathar and Patil 2011, Patel et al. 2015, Mehta et al. 2017, Kulkarni and Mehta 2020). There are only a handful of Protected Areas within its distribution range viz. Melghat TR and Tansa and Yawal WLS in Maharashtra, Purna WLS in Gujarat and Dadra and Nagar Haveli WLS. Much of its distribution lies outside the PA network where there is an urgent requirement for monitoring the conservation status of the habitat and species (Kasambe et al. 2004, Chavan and Rithe 2009, Laad and Dagale 2014, Patel et al. 2015, Mehta et al. 2017, https://ebird.org/india/region/IN-DN, accessed on 15 February 2021).

The Terrestrial Ecoregions map structured on concepts of biogeography was created to document global biodiversity (flora and fauna) and to plan conservation at global and regional levels (Olson et al. 2001). For the Indian context, they are more detailed than the biogeographic

zones and biotic provinces maps of Rodgers and Panwar (1988). The Forest Owlet distribution (historical and current) aligns closely with three ecoregions viz. NVDDF (Madhya Pradesh), NWGMDF (Gujarat, Dadra and Nagar Haveli and Maharashtra) and NDDF (Chattisgarh and Odisha) (Figure 2.1). The conservation status of the three ecoregions that comprise the Forest Owlet distribution range is Critical or Endangered due to the high levels of threats (Rawat and Wikramanayake 2002, Rawat et al. 2002a & b). This has severe conservation implications for the Forest Owlet which is endemic to India and which unfortunately is not mentioned among the important fauna of these landscapes in the ecoregions document. Much of the conservation focus in these landscapes are directed towards megafauna like Tiger and hence few PA's cover Forest Owlet habitat (Rawat and Wikramanayake 2002). This is especially true for the NVDDF in Madhya Pradesh where the Forest Owlet occurs in Reserve and managed Forests in the Districts of Khandwa, Burhanpur and Betul with severe anthropogenic pressure on the habitat (Jathar and Patil 2011, Jathar et al. 2015, Mehta and Kulkarni 2015, Mehta et al. 2017b). At the beginning of the century itself several authors warned of the severe ecological impacts of dams planned over the Narmada and Tapi Rivers that would inundate the habitat and lead to clearance of forests for re-settlement of dam-displaced human populations (Rawat and Wikramanayake 2002, Rawat et al. 2002a & b, Kasambe et al. 2004, Ishtiaq and Rahmani 2005). Other developmental activities impacting the habitat and the species are road building and widening (Jathar and Patil 2011) and speeding vehicles (Mehta et al. 2017b). The current implications of timber extraction, dams and roads on Forest Owlet conservation need to be assessed through status surveys for the species and its habitat.

Habitat degradation due to conversion to agriculture is of major concern in all three ecoregions but most so in the Nandurbar region of NVDDF and the historical presence sites of Forest Owlet in Chattisgarh and Odisha which fall within the NDDF ecoregion (Mehta et al. 2008, Jathar and Patil 2011, Mehta et al. 2017a, Kulkarni and Mehta 2020). A simulation with data collected in 2010-2011 from Toranmal Reserve Forest in the Nandurbar district predicts total destruction of the forest in the region by 2042 if the same pressure (as in 2011) continues (Jathar and Patil 2011). Other forms of habitat destruction include lopping of trees, grazing by livestock, legal timber extraction especially of Teak in managed forests (including nest trees), encroachments for housing and agriculture and fires to clear land (Ishtiaq and Rahmani 2000a, Ishtiaq and Rahmani 2005, Jathar and Rahmani 2004, Mehta et al. 2007, Jathar and Patil 2011, Mehta and Kulkarni 2015, Patel et al. 2015, Laad et al. 2016, Mehta et al. 2017a, Patel 2018, Kulkarni and Mehta 2020, Mehta 2020a).

Pesticides

Agriculture has concomitant threats such as use of pesticides and rodenticides, whose impact on the Forest Owlet have not been studied. Since rodents constitute a major prey group for the Forest Owlet and since many sightings of the bird are around agricultural fields, it is likely to adversely impact the species (Ishtiaq et al. 2002, Jathar and Rahmani 2004, Mehta and Kulkarni 2015, Laad et al. 2016, Mehta et al. 2018).

Hunting

Hunting, though not specifically targeted at the Forest Owlet, is likely to impact the species since owls (and owlets) in general are captured or killed for witchcraft, other superstitious beliefs and sometimes for entertainment (Jathar and Rahmani 2004, Mehta et al. 2007, Ahmed 2010, Jathar and Patil 2011, Mehta et al. 2017 a & b, Patel et al. 2015).

Tourism

Tourism in Wildlife Sanctuaries such as Melghat TR, Purna and Tansa need to be monitored for their impact on Forest Owlets, especially during the breeding season (Patel et al. 2015, Laad et al. 2016). In Toranmal RF, cultural tourism especially during the festival of Holi, sees a huge influx of people largely unregulated and who have a severe impact on forests due to fires and encroachment (Jathar and Patil 2011, Khan et al. 2018).

Another perceived threat is the excessive use of the call-playback method to attract birds which can have severe consequences, especially during the breeding season (Watson et al. 2018, Kannan and Santharam 2015). This is especially relevant for areas that have high birding tourism e.g. Tansa and Purna WLS and Toranmaal RF (Dore 2019). Strict guidelines on the ethical use of playback, with stringent protocols need to be prepared and followed by researchers too (Sen 2009, Barve et al. 2020).

Natural Predators

Natural predators of the Forest Owlet include several diurnal raptors such as the Shikra *Accipiter badius*, White-eyed Buzzard *Butastur teesa* and Peregrine Falcon *Falco peregrinus* which especially impact the overall breeding success by predating on fledgelings (Jathar and Rahmani 2004) and possibly even adults. If their populations rise due to certain habitat/climatic changes they could exacerbate extinction risks for Forest Owlet, especially in areas where they are rarer and already threatened by other factors such as habitat loss and degradation which makes them more visible to predators.

Other potential threats

Since the species occurs within a narrow range of latitudes and climatic conditions, climate change could potentially have a profound impact on its persistence. Currently there is no data to support this but long-term monitoring of populations along with systematically recorded information on climatic conditions in the range of the Forest Owlet could provide further insight. Genomic analysis can provide clues on the species response to past climatic fluctuations which could be used to infer potential impacts in the future (Natesh et al. 2020).

Although robust research is the need of the hour, research activities should adhere to protocols regarding permits and other formalities. Best Practice Guides are urgently required for techniques in capture and monitoring of the species.

Threat Scores

Jathar and Patil (2011) prepared a vulnerability matrix for Madhya Pradesh and Maharashtra through results from their studies which needs to be revisited especially since additional locations of presence and further information is now available on the species and its habitat. Based on presentations from the current meeting and publications, a similar threat score matrix has been prepared for currently known locations of Forest Owlet presence (Table 3.1a, b & c). Jathar and Patil (2011) identified Toranmal and Taloda in the Nandurbar district in Maharashtra as the most vulnerable sites nine years ago, and till today Nandurbar district continues to be the most threatened habitat for the Forest Owlet (Table 3.1b). The best habitat for the species is also located in Maharashtra in Melghat TR (Table 3.1b) which according to Mehta et al (2018) is the largest and most suitable habitat for the Forest Owlet in Central India and which is contiguous with Forest Owlet habitat in the RF areas of Madhya Pradesh bounding Maharashtra. However, as mentioned above, the RFs in Madhya Pradesh need special attention due to the severity of threats especially from timber harvesting operations, development, agriculture and use of pesticides (Table 3.1c). The Dangs District of Gujarat is the next most extensive habitat for the Forest Owlet and may perhaps be on par with Melghat TR in terms of suitability, extent and connectivity for Forest owlet populations (Table 3.1a). Several areas surrounding Purna WLS and the Districts of Valsad and Navsari need systematic surveying since they could hold good populations of the species (Patel et al. 2017, Patel 2018). Population fragmentation/connectivity is not clearly understood for most locations and it is important to identify habitat connectivity between known locations, especially since new sites of presence are now located in several areas e.g. Harsul, Nasik, Dadra and Nagar Haveli, Valsad, Navsari (Patel et al. 2017, Raha et al. 2017, Mishra 2021 https://ebird.org/india/region/IN-DN, accessed on 15 February 2021). The new locations lie between older known locations and suggest

connectivity. However, these need to be verified through surveys and ecological and genetic studies.

Table 3.1: Threats faced by the Forest Owlet at various locations in the three States where they are known to occur currently. Threats are ranked from 1 to 3, with 1 being the lowest threat score, 2 being a medium score and 3 being a high threat score.

3.1a: Gujarat

Localities	Dangs District RF	Purna WLS	Valsad District	Navsari District
Habitat degradation/fragmentation/loss	2	2	3	3
Hunting	2	1	2	1
Population fragmentation	1	1	3	3
Pesticides	2	2	2	3
Tourism	2	3	1	1
Development Infrastructure (Roads, Dams etc.)	3	2	3	3
Natural predators	2	2	1	1
Threat score (Lowest = 0, Highest = 21)	14	13	15	15

3.1b: Maharashtra

Localities	Tansa WLS	Nandurbar District	Melghat TR	Nasik Harsul
Habitat degradation/fragmentation/loss	3	3	1	3
Hunting	2	3	0	3
Population fragmentation	2	3	1	UK
Pesticides	3	3	2	UK
Tourism	3	2	2	2
Development Infrastructure (Roads, Dams etc.)	3	3	1	2
Natural predators	2	2	2	2
Threat score (Lowest = 0, Highest = 21) UK = unknown—not counted in score	18	19	09	12/**15**

3.1c: Madhya Pradesh

Localities	Khaknar Range	Khandwa District	Betul District
Habitat degradation/fragmentation/loss	3	3	2
Hunting	3	3	2
Population fragmentation	2	2	2
Pesticides	3	3	3
Tourism	1	3	1
Development Infrastructure (Roads, Dams etc.)	3	3	3
Natural predators	3	3	3
Threat score (Lowest = 0, Highest = 21) UK = unknown—not counted in score	18	20	16

Forest Owlet Conservation Action Plan (2021–2030)

Background

SACON organized an online meeting on 24-25 November 2020, for preparing a Conservation Action Plan for the Forest Owlet in the central Indian landscape. This was one of the objectives of an ongoing project being conducted at SACON in collaboration with IISER Tirupati, on the Forest Owlet. Participants included researchers, ornithologists, conservation NGOs, forest managers and policy makers, media, and representatives of local communities in the Forest Owlet range States. The main objectives of the meeting were to share and consolidate collective knowledge on the ecology and conservation status of the Forest Owlet and to develop a framework document.

The meeting began with a series of presentations by various institutions including SACON on their research work conducted on the Forest Owlet. Presentations were made on the distribution, behaviour, habitat requirements, threats, phylogeny and new techniques to study the species across its range in India. The second day of the meeting was focussed on the Conservation Action Plan workshop. Three groups were formed viz. Research, Policy/Management and Outreach. Participants were assigned to groups depending on their expertise. Each group met over a period of two hours to discuss the goal, gaps, strategies/desired outputs, and actions related to the group topic. This was followed by a reassembly of all groups for a brainstorming session where each group presented a summary of their discussions and the listed outputs and actions were debated by all present. The outcome of the discussions for each group are detailed below. Appendix-I details the actions against each output, the identified implementors (actors), time frame and budget for each action. Scorecards for research and capacity are provided in Appendix-II for three States which currently form the stronghold for Forest Owlet distribution. The scorecards list gaps in each strategic area and an outcome indicator for each gap. Outcome indicators are provided with reference scores from 0 to 3, with 0 suggesting a weak outcome and 3 a strong one. The outcomes are assessed for current/baseline scores with a corresponding target or desired score to be achieved within the duration of the CAP. Each outcome has a specific point depending on A list of priority actions required with the expected outcomes, for each State are provided in Appendix-III. A list of participants, along with their affiliating organizations, is provided in Appendix-IV. The contributors to the discussion in each group is provided in Appendix-V.

The overall goal of the Conservation Action Plan is to ensure a viable population of Forest Owlet and secure its habitat across its distribution range in India through collaborative actions and engagement with all stakeholders.

Research

Objective:

To generate crucial and robust information on the Forest Owlet through scientific studies on the ecology and habitat of the species and share and consolidate existing knowledge on the species for long-term conservation of the species.

Gaps Identified:

i. Inadequate information on the species including distribution status, population abundance, foraging (role of rodents), habitat requirements, nesting requirements, habitat connectivity, assessment of threats (use of pesticides, anthropogenic factors), diseases and methodological issues for surveys.
ii. Limited access to known studies.
iii. Inadequate funding.
iv. Difficulty in obtaining permits for access to survey areas, sample collection, banding and radio-tagging.

Strategies / Desired Outputs

i. Bridge information gap through research and generate robust information on the Forest Owlet.
ii. Documentation, regular assessment and monitoring of threats.
iii. Build capacity among locals and other interested citizens to enable them to participate in research and monitoring activities.
iv. Involvement of citizen scientists in monitoring and detecting the species.
v. Incorporation of robust new innovative methods like passive recording, banding of owlets and radio-telemetry.
vi. Standardized protocols for monitoring Forest Owlet populations and other ecological studies on the species and its habitat.
vii. A common platform to share research ideas/outcomes/methods, information on on-going projects; online (closed-group) data sharing portals.
viii. Approaching the corporate sector for funding.

ix. Collaboration with the forest department for long-term monitoring of the species.

Actions

i. Initiate research projects on the Forest Owlet and its habitat to obtain information on ecology, distribution and threats.
ii. Initiate a regular monitoring program for Forest Owlet with the involvement of the State Forest Departments, locals and interested citizen volunteers.
iii. Conduct capacity building workshops on skills development and methods for researchers, forest departments, citizen scientists and interested parties.
iv. Create public maps for areas that require action which can be accessed by citizen scientists to increase detections.
v. Initiate research for standardising new techniques for robust results
vi. Prepare best practice guides/manuals for research with standardised methods (e.g., conducting acoustic surveys ethically).
vii. Create a formal working group to share information on research outcomes, funding opportunities and best practices through annual meetings.
viii. Exchange information, share protocols and best practices with Forest Department.
ix. Create a virtual platform for data sharing within a closed group (collate historic data).
x. Approach corporate sectors for funding under Corporate Social Responsibility (CSR) and other funding agencies, national & international.
xi. Discuss with MoEFCC and State Forest Departments to streamline and expedite permit process for research.

Evaluation

i. Compilation of research activities through Annual Reports, presentations and peer reviewed papers.
ii. Reports on Capacity Building and measure of success through questionnaire assessments/evaluation by participants, involvement in research projects and information generation and sharing.
iii. Rigorous Peer review of best practice guides and protocol manuals.
iv. Assessment of the involvement/collaboration of forest department and citizen scientists in research programs and information generation.
v. Creation of a Forest Owlet working group for collaborative work, discussions and peer review of research and capacity development work. Measure success through number of collaborative research projects conducted, quantum of information generated for various aspects of Forest Owlet ecology, research bases and virtual platforms established.
vi. Comparison of the trend and quantum of funding obtained over years.

Stakeholders

Researchers, forest/wildlife managers, NGOs, citizen volunteers/scientists, local enthusiasts, MoEFCC–Government of India, State Forest Departments and other Line Departments, funding agencies.

Policy

Objective

To develop policy guidelines that would set conservation priorities and recommend management strategies at both local and landscape levels for the conservation of Forest Owlet populations in the central Indian landscape.

Gaps

i. Paucity of critical information on conservation and management of Forest Owlet populations that would aid in directing policy efforts.
ii. Inadequate coverage of Forest Owlet range under Protected Area network.
iii. Inadequate recognition of Forest Owlet sub-populations and network of sites in global conservation policies and initiatives.
iv. Omission of Forest Owlet sub-populations inhabiting human-modified landscapes from conservation plans and initiatives.
v. Absence of incentives ('*Access to Benefit Sharing*') to local communities for protecting Forest Owlet sites and populations in human-modified landscapes.
vi. Inadequate awareness and skill among frontline field staff of Forest Dept and other stakeholders on the conservation significance of Forest Owlet.

Strategies / Desired Outputs

i. Collation of all published and unpublished information, critical to taking key decisions for Forest Owlet conservation and synthesizing them to draw management implications at more local levels.
ii. Ensured protection of existing populations of Forest Owlet by increasing the Protected Area coverage of Forest Owlet range in the landscape and finding creative ways to conserve the species outside PAs.
iii. Increased global visibility and recognition of key sub-populations and locations of Forest Owlet, especially outside Protected Areas.
iv. Landscape level conservation strategies adopted to address Forest Owlet populations in human-modified landscapes and habitats.
v. Incentivized protection of Forest Owlet populations and habitats for local communities through innovative solutions like ecotourism and compensation of opportunity costs.
vi. Enhanced awareness and professional skill of frontline staff of Forest Department and other stakeholders, including media personnel, line department officials, in identifying Forest

Owlets and their conservation significance, and in legal matters with specific reference to offence against Forest Owlets including their habitat.

Actions

i. Develop a systematic, time-bound, and integrated Species Recovery Plan (SRF) for Forest Owlet in the central Indian landscape and incorporate the SRP into Tiger Conservation Plans/ Management Plans/ Working Plans.
ii. Conduct a Systematic Conservation Planning (SCP) and gap analysis to identify and prioritize sites holding significant sub-populations of Forest Owlet and potential habitats for recommendation to be designated as a suitable PA category (WLS, Conservation Reserve, or Community Reserve) under Wild Life (Protection) Act of India.
iii. Results from the SCP exercise can be used to adopt landscape level conservation strategies to address Forest Owlet populations in human-modified landscapes and habitats.
iv. Identify key Forest Owlet locations, hitherto unrecognized, as Important Bird & Biodiversity Areas (IBAs) and work with BNHS-India and BirdLife International for their formal designation. Designate key sites of Forest Owlets as 'Biodiversity Heritage Hotspots' in line with NBA guidelines.
v. Incentivize protection of Forest Owlet populations and habitats for local communities through innovative solutions like ecotourism and compensation of opportunity costs.
vi. Conduct capacity-building programs for the frontline staff of Forest department and other stakeholders in all the range states in identification and population monitoring of Forest Owlets, protection of their nesting trees and habitats, and in legal matters related to wildlife crime against Forest Owlet**.**

Evaluation

i. Rigorous peer-review of Recovery Plan by researchers, conservationists, and forest/wildlife managers
ii. Establishment of a monitoring mechanism to ensure implementation of Recovery Plan at various stages. Measure the success through increase in species populations and sites.
iii. Management Effectiveness Evaluation at regular intervals by an independent committee of experts comprising senior forest administrators/managers, scientists, and conservationists. Measure the success by population trends of Forest Owlet in PAs and reduction of anthropogenic pressures from local communities.
iv. Regular monitoring of newly designated IBAs by involving local NGOs and grassroot institutions. Measure the success through increase in owlet populations and breeding success.

v. Regular census of Forest Owlets living on the edges of forests and agricultural fields and measure the success of new initiatives from increase in nesting pairs of owlets.
vi. Measure the success of the ecotourism initiatives from increase in Forest Owlet populations and growth in annual per capita income of local communities.
vii. Measure the success of the capacity-building workshops from reduction in cases of wildlife offence involving Forest Owlet, increase in number of convictions against the offenders, growth in number of Forest Owlets, increased media coverage on Forest Owlet conservation issues, and increase in general awareness of locals on legal protection accorded to Forest Owlets.
viii. Annual Reports on implementation of Recovery Plan, capacity building workshops, census exercises, ecotourism, monitoring of IBAs and Management Effectiveness Evaluation.

Stakeholders

Forest/wildlife managers, Forest Owlet researchers, and conservation NGOs working at grassroots level, State and National Biodiversity Boards, conservationists, local communities, landscape ecologists, land-use planners, forest and other line departments, economists, tourism department, birding tour operators, legal practitioners and media personnel.

Outreach

Objective

To create a network of stakeholders who would contribute towards the conservation of the species through various activities and roles and to design effective strategies for outreach for the conservation of the Forest Owlet.

Gaps

i. Lack of continuous/sustained outreach and education programs: Need for long-term outreach and education.
ii. Poor representation of target groups and not all are reached equally.
iii. Insufficient communication between researchers and outreach groups.

Strategies / Desired Outputs

i. Long-term education programs, tailored to each stakeholder designed.
ii. Target groups which may be hard to reach but important, identified.
iii. Appropriate material for easy access designed for target audience, created.
iv. Greater interaction and feedback between on-ground researchers, outreach groups and other stakeholders, established.

v. New, important outcomes in research communicated to all stakeholders and general public.

Actions

i. Monthly meetings with local panchayats and communities.
ii. Awareness workshops for local communities, Protected Area staff, NGOs, local field guides.
iii. Important one-day events (such as Owlet day).
iv. School-based education curriculum - Talks, Nature walks.
v. Training for citizen science activities.
vi. Awareness and Nature camps especially for tribal children living in Forest Owlet habitats.
vii. Capacity building of locals through training in bird watching as potential “Forest Owlet watchers”.
viii. Identify current programs that could include more target groups with thematic interventions for conservation of Forest Owlet Conservation—e.g. Forest Owlet Conservation Day.
ix. Platform for interaction/engagement between multiple stakeholders - such as owl festival.
x. Colourful games/books for children and posters for communities in vernacular language, with information on threats to Forest Owlet and its habitat.
xi. Festivals like Mowgli Utsav (Madhya Pradesh) targeted towards school children.
xii. Local community-based monitoring initiatives- farmers as potential Forest Owlet spotters.
xiii. Provide a common platform for all stakeholders (Working group - Researchers, Experts and Education Managers) such as an online platform/website for communication for continuous communication of ongoing research- with SACON/WRCS/Any other organization as coordinator.
xiv. Communicate research in more accessible forms (popular articles / blogs / summary write-ups) - Monthly newsletter.

Some on-going action / programs which should be continued:

i. Owl festival by Ela Foundation (annual).
ii. Forest Owlet Conservation Day by Owl Conservation Foundation in collaboration with the Forest Department (24th October every year).
iii. Tribal school outreach by NCSN (occasional).
iv. Dangs Bird Festival (annual).
v. World Owl Conference.
vi. Print & social media coverage by various research groups (occasional).
vii. Outreach and awareness activities by WRCS in Melghat TR in Maharashtra and Reserve Forest Divisions in Madhya Pradesh.

Evaluation

i. Short-term (after every meeting) and long-term evaluation - formative and summative feedback from participants.
ii. Monitoring change in attitude, awareness, behaviour of communities and indivduals.
iii. If there is no change in attitude/awareness - redesign workshop strategies (course correction).
iv. Reports.
v. Assessment of the reach of the events organized.
vi. Mechanism for feedback from various users on the online platform/website.
vii. Evaluate inputs from various groups.

Stakeholders

Local communities (especially farmers), State Forest Departments, NGOs, Researchers, Tribal Schools- Students and Teachers, Eco-development committees, Media, Wildlife Photographers, individuals and communities involved in illegal practices like poaching, black magic etc..

Ten-year Budget for Forest Owlet Conservation

Head	Objective	Budget (INR)
Research	To generate crucial and robust information on the Forest Owlet through scientific studies on the ecology and habitat of the species and share and consolidate existing knowledge on the species for long-term conservation of the species.	12,85,00,000.00
Policy/Management	To develop policy guidelines that would set conservation priorities and recommend management strategies at both local and landscape levels for the conservation of Forest Owlet populations in the central Indian landscape.	10,15,00,000.00
Outreach	To create a network of stakeholders who would contribute towards the conservation of the species through various activities and roles and to design effective strategies for outreach for the conservation of the Forest Owlet.	2,50,00,000.00
Total Budget		**25,50,00,000.00**

Details of budget against Actions are provided in Appendix-I.

References

Ahmed, A. (2010). Imperilled Custodians of the Night: A study on illegal trade, trapping and utilization of owls in India. TRAFFIC India/ WWF-India. New Delhi, India.

Ali, S. A. and Ripley S. D. (1969) *Handbook of the Birds of India and Pakistan*. Oxford University Press, Bombay, Vol.3: 302–303.

Anand, A.V. (2019). A Comparative Study on the Nest Site Selection and Cavity Availability of the Forest owlet *Heteroglaux blewetti* and other Sympatric Owls in Khandwa District, Madhya Pradesh. A Dissertation Submitted to Pondicherry University in Partial Fulfilment of the Requirement for the Award of the Degree of Masters in Ecology and Environmental Sciences. Pp 40.

Barve, S., Raman, T. R. S, Datta, A., and Jathar, G. (2020). When and how to study the nesting biology of Indian birds: Research needs, ethical considerations, and best practices. *Indian BIRDS* 16 (1): 1–9.

BirdLife International. (2018). *Heteroglaux blewitti*. The IUCN Red List of Threatened Species 2018: e.T22689335A132251554. http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22689335A132251554.en. Downloaded on 28 February 2021.

Blandford, W. T. (1895). *The fauna of British India including Ceylon and Burma. Birds–Vol. III.* Taylor and Francis, London.

Chavan, R.A. and Rithe, K.D. (2009). An occurrence and Breeding record of the Forest Owlet *Athene (Heteroglaux) blewitti* from Yawal Wildlife sanctuary, Maharashtra, India. *Journal of the Bombay Natural History Society*, 106(2): 207–208.

Dore, B. (2019). Did you call? Misuse of bird call audio is disturbing bird behaviour. *Mongabay*. https://india.mongabay.com/2019/09/did-you-call-misuse-of-bird-call-audio-is-disturbing-bird-behaviour, accessed on 20 April 2021.

Hume, A. O. 1(873). Novelties? *Heteroglaux blewitti. Stray Feathers* I (6): 464–483.

Ishtiaq, F., and Rahmani, A. R., (2000a). Further information on the status and distribution of the Forest Owlet *Athene blewitti* in India. *Forktail,* 16: 125–130.

Ishtiaq, F., Rahmani, A.R. and Rasmussen, P.C. (2002). Ecology and behaviour of the Forest Owlet *Athene blewitti*. In Newton, I., Kavanagh, R.P., Olsen, J. and Taylor, I.R. (eds) Ecology and Conservation of Owls: 80–88. Melbourne: CSIRO Publishing.

Ishtiaq, I. and A.R. Rahmani, (2000b). Cronism in the Forest Owlet *Athene (Heteroglaux) Blewitti. Forktail,* 16: 172–174.

Ishtiaq, F. (2011). Response to “Discovery of a possible hybrid of the Critically Endangered Forest Owlet *Athene blewitti* and Spotted Owlet *Athene brama* (Aves: Strigiformes) from northern Maharashtra, India” by Pande et al. *Journal of Threatened Taxa,* 3(5): 1798.

Jathar, G. A (2006) Ecology and behaviour of the Forest Owlet Heteroglaux blewitti. A thesis submitted to University of Mumbai, Bombay Natural History Society.

Jathar, G. A. and A. R. Rahmani (2004) Ecological studies of the Forest Spotted Owlet *Athene (Heteroglaux) blewitti.* Final Report. Bombay Natural History Society, Mumbai, India. Pp 77.

Jathar, G. and Patil, D. (2011a). A review of "Discovery of possible hybrid of the Critically Endangered Forest Owlet *Athene blewitti* and Spotted Owlet *Athene brama* from northern Maharashtra". *Journal of Threatened Taxa,* 3(5): 1800–1803.

Jathar, G. and Patil, D. (2011b). Reassessment of the Status of the Forest Owlet in its known distribution and Evaluation of Conservation Issues: Final Report. Watershed Organization Trust, Pune. Pp.71.

Jathar, G.A. and Rahmani, A.R. (2011). Ecology of the Forest Owlet: A Comprehensive Study of the Critically Endangered Forest Owlet in Central India. Lambert Academic Publishing, Germany. Pp.198.

Jathar, G. and Rahmani, A.R. (2012). Habitat utilization by Forest Owlet *Heterogalux blewitti* in Toranmal Reserve Forest, India. *Journal of Care4Nature,* 1: 18–30.

Jathar, G., Patil, D., Kalra, M., de Silva, T., Peterson, A. T., Irfan-Ullah, M., Rahmani, A.R., Mehta, P. and Kulkarni, J. (2015). Mapping the Potential Distribution of the Critically Endangered Forest Owlet *Heteroglaux blewitti* in India. *Journal of Bombay Natural History Society*, *112*(2), 55-64. https://www.researchgate.net/publication/311969756_Modeling_the_distribution_of_the critically_endangered_Forest_Owlet_Heteroglaux_blewitti_in_India, accessed on 28 February 2021.

Kannan, R., and Santharam, B. (2015). Discourage voice playbacks in the breeding season. *Indian BIRDS* 10 (5): 140.

Kasambe, R., Pande, S., Wadatkar, J. and Pawashe, A. (2004). Additional records of the Forest Owlet Heteroglaux blewitti Hume, 1873, in Melghat Tiger Reserve, Maharashtra. *Newsletter for Ornithologists*, 1:12–14.

Koparde, P., Mehta, P., Reddy, S., Ramakrishnan, U., Mukherjee, S., and Robin, V. V. (2018). The critically endangered forest Owlet *Heteroglaux blewitti* is nested within the currently recognized *Athene* genus: A century-old debate addressed. *PLoS ONE*, *13*(2), e0192359.

Koparde, P. (2019). Molecular phylogeny and comparative biogeography of owlets in India. A Doctoral thesis submitted to the Manipal Academy of Higher Education. Pp. 139.

Koparde P., Mehta P., Mukherjee S. and Robin V.V. (2019). Quaternary climatic fluctuations and resulting climatically suitable areas for Eurasian owlets. *Ecology and Evolution*, 9:4864–4874. https://doi.org/10.1002/ece3.5086.

King, B. F., and Rasmussen, P. C. (1998). The rediscovery of the Forest Owlet *Athene (Heteroglaux) blewitti. Forktail,* 14 (August): 51–53.

Laad, S. and Dagale, R. (2014). First report of Forest Owlet *Heteroglaux blewitti* from Tansa Wildlife Sanctuary (Western Ghats), Maharashtra, India. *Journal of the Bombay Natural History Society,* 111 (2): 134.

Mahajan, A,, Lad P., Ingole, V., Khode, M., Kasambe, R. and Wadatkar, J. (2012). Checklist of birds of Mahendri Reserve Forest, Amravati, *Maharashtra. Newsletter for Birdwatchers,* 52(2): 17–23.

Mehta P., Kulkarni, J., Patil, D., Kolte, P., and Khatavkar, P. (2007). A survey of critically endangered Forest Owlet (*Heteroglaux blewitti*) in 5 states of India. Final report submitted to the Ministry of Environment and Forests, New Delhi.

Mehta, P., Kulkarni, J., and Patil, D. (2008). A survey of the critically endangered Forest Owlet *Heteroglaux blewitti* in central India. *BirdingASIA,* 10: 77–87.

Mehta, P., Prasanna N. S., Nagar, A. K., and Kulkarni, J., (2015). Occurrence of Forest Owlet *Heteroglaux blewitti* in Betul District, and the importance of its conservation in the Satpura landscape. *Indian BIRDS,* 10 (6): 157–159.

Mehta, P. (2020a). The Forest Owlet. https://www.sanctuarynaturefoundation.org/article/the-forest-owlet (accessed on 25 February 2021).

Mehta, P. (2020b). Why We should Care Two Hoots for India's Forest Owlet. https://science.thewire.in/environment/forest-owlets-satpura-hills-ecological-research/ (accessed on 09 June 2021).

Mehta P. (2020c). Past, Present and Future of the Forest Owlet in India. Wild Melghat. E magazine for Melghat Tiger Reserve.

Mehta, P., Kulkarni, J., Mukherjee, S., Chavan, S. and Anand, A. (2017a). A distribution survey of the Forest Owlet *Heteroglaux blewitti* in north-western Maharashtra. Indian Birds 13:103–108.

Mehta, P., Anand, A. and Kulkarni, J. (2017b). A Study on Population, Demography and Ecology of Forest Owlet in East Kalibhit Forests, Khandwa District, Madhya Pradesh. Final Technical Report submitted to Raptor Research and Conservation Foundation, Mumbai. Wildlife Research and Conservation Society. Pp 139.

Mehta, P. and Kulkarni, J. (2018). Diets of sympatric Forest Owlets, Spotted Owlets, and Jungle Owlets in East Kalibhit forests, Madhya Pradesh, India. *Journal of Raptor Research,* 52 (3): 338–348.

Mehta, P., Talmale, S., Kulkarni V., and Kulkarni J. (2020). All About Owl Diet. A Technical Manual for Identification of Prey Remains from Owl Pellets in Central India. Published by Raptor Research and Conservation Foundation, Mumbai, and Wildlife Research and Conservation Society. Pune. Pp 203.ISBN 978-93-5391-691-6

Mukherjee, S., Robin, V.V., Mehta, P. and Koparde, P. (2016). Determining taxonomic and conservation status of the critically endangered Forest Owlet (*Heteroglaux blewitti*). Sálim Ali Centre for Ornithology and Natural History. Technical Report No. PR-4812. 1–82 pp.

Narasimmarajan, K. and Mahato, S. (2013). Noteworthy Records of Critically Endangered Forest Owlet *Athene (Heteroglaux) blewitti* in the Amravati District of Maharashtra, Central India. *World Journal of Zoology*. 8: 240-242. 10.5829/idosi.wjz.2013.8.3.73184.

Natesh, M., Vinay, K.L., Ghosh, S., Jayapal, R., Mukherjee, S., Vijay, N. and Robin, V.V. (2020). Contrasting trends of population size change for two Eurasian owlet Species—*Athene brama* and *Glaucidium radiatum* from South Asia over the Late Quaternary. *Frontiers in Ecology and Evol*ution 8:469. doi:10.3389/fevo.2020.608339.

Olson, D.M., Dinerstein, E., Wikramanayake, E.D., Burgess, N.D., Powell, G.V.N., Underwood, E.C., D'Amico, J.A., Itoua, I., Strand, H.E., Morrison, J.C., Loucks, C.J., Allnutt, T.F., Ricketts,

T.H., Kura, Y., Lamoreux, J.F., Wettengel, W.W., Hedao, P., Kassem, K.R. (2001). Terrestrial ecoregions of the world: a new map of life on Earth. *Bioscience,* 51(11):933–938.

Pande, S.A., Pawashe, A.P., Kasambe, R., and Yosef, R. (2011a). Discovery of a possible hybrid of the Critically Endangered Forest Owlet *Athene blewitti* and Spotted Owlet *Athene brama* (Aves: Strigiformes) from northern Maharashtra, India. *Journal of Threatened Taxa,* 3(4): 1727–1730.

Pande, S.A., Pawashe, A.P., Kasambe, R. and Yosef, R. (2011b). Reply to the Response to Pande et al. by Ishtiaq. *Journal of Threatened Taxa,* 3(5): 1799.

Pande, S.A., Pawashe, A.P., Kasambe, R. and Yosef, R. (2011c). Reply to the Response to Pande et al. by Jathar & Patil. *Journal of Threatened Taxa,* 3(5): 1804.

Patel, J. R., Patel, S. B., Rathor, S. C., Patel, J. A., Patel, P. B., and Vasava, A. G. (2015). New distribution record of the Forest Owlet *Heteroglaux Blewitti* Hume 1873 (Aves: Strigiformes: Strigidae) in Purna Wildlife Sanctuary, Gujarat, India. *Journal of Threatened Taxa,* 7 (12): 7940–7944.

Patel, J., Vasava, A. and Patel, N., (2017). Occurrence of the Forest Owlet *Heteroglaux blewitti* in Navsari and Valsad Districts of Gujarat, India. *Indian BIRDS,* 13 (3): 78–79.

Patel, K. (2018). In search of the Forest Owlet. *Saevus,* March-May: 24–25.

Rasmussen, P. C. and Collar, N.J. (1998). Identification, distribution and status of the Forest Owlet *Heteroglaux* (*Athene*) *blewitti*. *Forktail,* 14: 41–49.

Rasmussen, P. C. and Collar, N.J. (2013). Phenotypic evidence for the specific and generic validity of *Heteroglaux blewitti. Forktail*, 29: 78–87.

Rawat G.S. and Wikramanayake, E.D. (2002). Southern Asia: Central India. ***In.*** Terrestrial Ecoregions of the Indo-Pacific: A Conservation Assessment. Editors: E. Wikramanayake, E. Dinerstein, C. J. Loucks, D. M. Olson, J. Morrison, J. Lamoreux, M. McKnight, and P. Hedao. 2002. Island Press, Washington, DC. 643. https://www.worldwildlife.org/ecoregions/im0207.

Rawat G.S., Desai, A., Somanathan, H. and Wikramanayake, E.D. (2002a). Southern Asia: Western India. ***In.*** Terrestrial Ecoregions of the Indo-Pacific: A Conservation Assessment. Editors: E. Wikramanayake, E. Dinerstein, C. J. Loucks, D. M. Olson, J. Morrison, J. Lamoreux, M. McKnight, and P. Hedao. (2002). Island Press, Washington, DC. 643. https://www.worldwildlife.org/ecoregions/im0134.

Rawat G.S., Desai, A., Somanathan, H. and Wikramanayake, E.D. (2002b) Southern Asia: Eastern India. ***In.*** Terrestrial Ecoregions of the Indo-Pacific: A Conservation Assessment. Editors: E. Wikramanayake, E. Dinerstein, C. J. Loucks, D. M. Olson, J. Morrison, J. Lamoreux, M. McKnight, and P. Hedao. 2002. Island Press, Washington, DC. 643. https://www.worldwildlife.org/ecoregions/im0208.

Rithe, K. (2003). Saving the Forest Owlet. Sanctuary Asia XXIII (1) (February) 30–33.

Sen, S. K., (2009). Bird call playback ethics and science: what do we know about it? Website URL: http://www.kolkatabirds.com/callplayback.html. Accessed on 21 April 2021.

Watson, D.M., Znidersic, E. and Craig. M. D. (2018). Ethical birding call playback, and conservation. *Conservation Biology,* 33:469–471. Doi: 10.1111/cobi.13199.

Yosef, R., Pande, S.A., Pawashe, A., Kasambe, R. and Mitchell, L. (2010). Interspecific interactions of the Critically Endangered Forest Owlet (*Athene blewitti*). *Acta Ethologica,* 13: 3–67; http://dx.doi. org/10.1007/s10211-010-0070-9.

APPENDIX-I: Time frame and budget for actions

Research

Desired Output	Actions	Actor	Time-frame*	Budget (INR)
Bridge the information gap	Initiate research projects on ecology, genetics, habitat etc.	Research organisations, NGOs conducting research, Forest Department, MoEFCC	Short–Long term projects	6,00,00,000.00
	Targeted expanded search for species			50,00,000.00
Regular monitoring and assessment of threats	Initiate a monitoring program for presence, population size, new locations, habitat	Forest Department, Research organisations, NGOs conducting research	Long-term Annual monitoring	3,00,00,000.00
Involvement of locals and interested citizens	Capacity building workshops	Forest Department, Research organisations, NGOs conducting research	Short-term Annual, as required	50,00,000.00
	Create public maps of specific areas which citizens can access and add information through detections		Short term with updates	
Incorporate robust new innovative methods in research	Standardisation of techniques	Research organisations, NGOs conducting research	Several Short-term projects	2,00,00,000.00
Standardised protocols for monitoring Forest Owlet	Best practice guides, manuals outlining standardised methods	Research organisations, NGOs conducting research	Short-term	50,00,000.00
Sharing information and knowledge	Seminars and meetings for knowledge exchange	Forest Departments, Research organisations, NGOs conducting research	Short-term As required	20,00,000.00
	Create virtual platform		Short-term	
Funding opportunities	Approach corporate sectors	Research organisations, NGOs conducting research	Short-term	15,00,000.00
TOTAL				**12,85,00,000.00**

***Short-term < 3 years; Medium-term = 3–5 years; Long-term = >5 years; Annual = over 10 year period; Monthly = over 10 year period**

Policy

Desired Output	Actions	Actor	Time-frame	Budget
Collation of information	Prepare Species Conservation and Recovery Plans, where needed and Conservation Action Plan for select Forest Owlet habitats	Research organisations, NGOs conducting research	Short-term	5,00,000.00
	Incorporate into Tiger Conservation Plan/ Management Plans/ Working Plans	Forest Departments, NTCA	Short-term with updates	-
Ensure protection through PA coverage	Gap Analysis to identify priority sites to incorporate into PA network	Forest Departments, Research organisations, NGOs conducting research	Short-term with updates	30,00,000.00
	Systematic Conservation Plan			
Global visibility	Identify key Forest Owlet Conservation Sites as IBAs	Research organisations, NGOs conducting research, MoEFCC	Short-term with updates	20,00,000.00
	Designate key sites as Biodiversity Heritage Hotspots	Forest Departments, MoEFCC, Research organisations, NGOs conducting research	Short-term with updates	10,00,000.00
Conservation outside PAs	Adopt landscape level conservation strategies for human modified habitats and encourage organic/natural agricultural practices	Local communities, Forest Departments, Line Departments, MoEFCC, Conservation NGOs	Short-Long term	6,00,00,000.00
Incentivised protection	Initiate ventures like Ecotourism, forest fire mitigation and monitoring committees	Forest Departments, Line Departments, MoEFCC, Conservation NGOs	Short-Long term	3,00,00,000.00
Enhanced awareness	Capacity building workshops for frontline staff of Forest Departments and other stakeholders	Forest Departments, MoEFCC, Research organisations, NGOs conducting research, conservation NGOs	Short-term Annual, as required	50,00,000.00
Total				**10,15,00,000.00**

Outreach

Desired Output	Actions	Actor	Time-frame	Budget
Long-term education programs, tailored to each stakeholder designed.	School-based education curriculum	NGOs and Institutes dealing with Nature Education,	Short-term with updates	20,00,000.00
	Festivals like Mowgli Utsav (Madhya Pradesh) targeted towards school children	Forest Department, Conservation NGOs	Short-term Annual	25,00,000.00
	Training for citizen science activities	Conservation and Research NGOs and Institutes	Short-term As required	20,00,000.00
	Nature camps especially for tribal children living in Forest Owlet habitats & further train them as potential "Forest Owlet watchers"	NGOs and Institutes dealing with Nature Education, Forest Departments	Short-term Annual	50,00,000.00
	Awareness workshops for Protected Area staff, NGOs, local field guides.	Conservation and Research NGOs and Institutes, Forest Departments	Short-term Annual	20,00,000.00
	Important one-day events/competitions (such as Owlet day)	Forest Department, Conservation NGOs	Short term Annual	10,00,000.00
Identify Target groups	Monthly meetings with local panchayats and communities	Forest Department, Conservation NGOs	Long-term Monthly	10,00,000.00
	Local community-based monitoring initiatives—farmers as potential Forest Owlet spotters and on-field monitoring	Conservation and Research NGOs and Institutes, Forest Departments	Long-term Regular	10,00,000.00
	Identify current programs that could include more target groups - Forest Owlet Conservation Day	Conservation and Research NGOs and Institutes, Forest Departments	Short-term	10,00,000.00
Appropriate material for easy access designed for target audience, created	Colourful games/books for children in vernacular language.	NGOs and Institutes dealing with Nature Education,	Short-term	30,00,000.00
Greater interaction and feedback between on-ground researchers, outreach groups and other stakeholders established.	Online platform/website for communication for all stakeholders (Working Group).	Conservation and Research NGOs and Institutes	Short-term	10,00,000.00
	Platform for interaction/engagement between multiple stakeholders - such as owl festival.	Conservation and Research NGOs and Institutes	Short-term Regular	10,00,000.00
Research communicated to all stakeholders and general public	Communicate research in more accessible forms (popular articles / blogs / summary write-ups) - Monthly newsletter.	NGOs and Institutes dealing with Nature Education, Research Organisations	Short-term Regular	25,00,000.00
Total				**2,50,00,000.00**

APPENDIX-II: Research and Capacity Scorecards

Maharashtra

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
Information gap	1. Existing information on presence and distribution of Forest Owlet in the region.	There is some general scattered information on the presence and distribution of Forest Owlet but needs additional updates.	0	1	3	Information on presence differs among locations and while certain areas are better studied with data from several years e.g. Melghat TR, Nandurbar Division and Tansa WLS, some areas such as Nashik Harsul are relatively new locations and not much information exists. However, a standardised monitoring protocol should be used for grid level information (e.g. randomly picked 1*1 km sampling grid cells) across the species range. This could be used for occupancy based analysis as well as for density estimates if the birds are marked/ringed. Other information on habitats based on hypotheses should also be collected periodically. This needs regular (annual) monitoring for long-term estimates and trends in distribution and population level information. Similar surveys should be carried out in areas that are potential habitats (as predicted through niche/habitat/distribution models) but with no current records of the species. Areas surrounding known locations which have similar forest cover and composition should also be surveyed for the presence of the species.	High
		Information on Forest Owlet presence and distribution exits at the range level.	1				
		Information on Forest Owlet presence and distribution exits at the beat level.	2				
		Information on Forest Owlet presence and distribution exits through systematic grid-based sampling with standardised protocols which can be used for determining and comparing presence and occupancy estimates for long-term monitoring purposes.	3				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
	2. Understanding threats to Forest Owlet in the region.	Threats to Forest Owlet in the region (inside and outside PA's) is largely speculative without adequate data.	0	1	3	General threats to the Forest Owlet are known but a measure of their impact on Forest Owlet populations is urgently required. Much of the information available is from older studies, especially around Tansa WLS and Nandurbar Division. In some areas such as Nashik Harsul which are new locations with very little information on Forest Owlet available from there. Threats need to be documented, monitored for updating and measured. This is especially relevant to threats such as habitat degradation and pesticide use which are on the rise.	High
		Threats to Forest Owlet in the region are known but not measured	1				
		Some threats to Forest Owlet in the region (inside and outside PA's) are known and measured but not all threats are understood	2				
		All threats to Forest Owlet in the region are understood, measured and documented.	3				
	3. Understanding the ecology of Forest Owlet (population size habitat, diet, breeding biology, movement patterns, longevity etc.)	There is no information available on the ecology of Forest Owlet in the region.	0	1	3	There have been several surveys for the Forest Owlet in Tansa WLS and Nandurbar Division and some ecological studies in Nandurbar Division and Melghat TR. However, except for Melghat TR most other surveys and studies were either initiated relatively recently (Tansa WLS since the discovery of the species there) or were studies conducted with years of intervening gaps. Information gaps exist on population size/abundance, habitat requirements, nesting requirements, habitat and population connectivity, disease, genetic diversity, among others. Studies addressing these are urgently required at all sites of occurrence with regular/annual monitoring especially of population trends and status of habitat.	High
		There is some information available on the ecology of Forest Owlet but this is inadequate.	1				
		Ecological aspects of Forest Owlet are well documented but only in some areas.	2				
		Adequate knowledge on the ecology of Forest Owlet is available to plan their conservation.	3				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
Awareness and recognition of Forest Owlet	1. Awareness on the presence of Forest Owlet in PA and outside, their legal status and capacity to identify Forest Owlet, among Forest Department Staff	The Forest Department staff are not aware of Forest Owlet in their landscape or of its legal status.	0	2	3	The ability of Forest Department field staff to identify Forest Owlet through calls and sightings differs across sites and individuals. It is essential that most staff especially Forest Guards are trained to identify calls and also the bird to ensure regular monitoring in their respective jurisdictions. They can serve as the primary sources of information on the presence of the Forest Owlet for monitoring purposes as well as information on new locations. Workshops on capacity building for this should be initiated at all presence sites.	Medium
		The Forest Department staff are aware of the presence of Forest Owlet in their landscape and its legal status but are not able to identify the bird visually or by its calls.	1				
		Some Forest Department staff are aware of Forest Owlet in their landscape, its legal status and are able to identify the bird visually or by its calls.	2				
		All Forest Department staff are aware of the Forest Owlet in their landscape, its legal status and can identify the bird visually and by its calls.	3				
	2. Awareness on the presence of Forest Owlet, capacity to identify Forest Owlet, knowledge of habits of Forest Owlet and ability to identify them, among local communities.	The locals have no knowledge on Forest Owlet in their landscapes	0	2	3	The Forest Owlet, especially in Maharashtra is a well-known species and many locals, particularly the ones living around Forest Owlet habitats would be aware of the species. However, the legal status of the species and the implications may not be known to all. At present, there are no continuous/sustained outreach and education programs in most localities, apart from Melghat TR, and there is an urgent need for long-term outreach and education. Not all target groups are reached equally or are well-represented (e.g. schools, colleges, women, urban and	High

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
		Locals are aware of the presence and general habits of Forest Owlet in their landscape and its legal status but cannot identify it.	1			rural public). Greater communication is required between researchers and outreach groups to spread knowledge on the Forest Owlet and its biology to citizens. Citizens can be involved in gathering information on Forest Owlet presence and trends over years akin to other Citizen Science programs in the country.	
		Some locals are aware of Forest Owlet in their landscape, its general habits and legal status and can identify it, but this does not apply to most.	2				
		Most locals are aware of Forest Owlet in their landscapes, their habits and legal status and can and can identify them.	3				
	3. Awareness among NGOs working on wildlife and conservation related issues on the presence of Forest Owlet in the region, its legal status, general habits and habitat associations.	Local NGO's working on wildlife and conservation related issues have no knowledge on Forest Owlet in their landscape	0	3	3	The Forest Owlet, especially in Maharashtra, is a well-known species among wildlife enthusiasts and NGOs working on Wildlife and Conservation related issues would be aware of the Forest Owlet and its legal status. However, apart from a few NGOs actively involved in research, many are not aware of the requirement for obtaining crucial ecological information on the species. There is a need to spread awareness regarding research using modern tools, since crucial available information on the species is obtained through systematic research efforts using modern techniques.	Medium
		Local NGO's working on wildlife and conservation related issues are aware of the presence of Forest Owlet in their landscape but are unaware of its legal status or habits and habitat associations.	1				
		Some local NGO's working on wildlife and conservation related issues are aware of the presence of Forest Owlet in their landscape, its legal status, general habits and habitat associations.	2				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
		All local NGO's working on wildlife and conservation related issues are aware of the presence of Forest Owlet in their landscape, its legal status, general habits and habitat associations.	3				
	4. Awareness among other administrative/Line Departments in the region on the presence of Forest Owlet inside and outside PA's.	Line Departments functioning in the region have no knowledge on Forest Owlet in their landscape	0	0	3	Although the Forest Owlet and its rarity is well known among conservation circles and birding enthusiasts even in the general public, there is perhaps not enough awareness regarding the species among Line Department personnel in the districts where the bird occurs. Since the habitat of the species also occurs outside PAs and transcends into other land regimes with separate jurisdictions and rules, it is pertinent to spread awareness among Line Department personnel who control such land. For example, surveys and studies have found a strong association with Forest Owlet presence and agricultural fields. The agriculture and horticulture departments should be roped into the conservation schemes, especially related to the kind of agricultural practices and use of pesticides. The evaluation summaries on threats can be used to identify such Line Departments. Awareness workshops, reading material and other activities can be planned to involve Line Departments in conserving the Forest Owlet.	High
		Line Departments in the region are aware of Forest Owlet in their landscape but are not aware of its legal status or habits and habitat associations.	1				
		Some Line Departments in the region are aware of the legal status and conservation requirements of Forest Owlet in their landscape but not all.	2				
		All Line Departments in the region are aware of the legal status and conservation requirements of Forest Owlet in their landscape.	3				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
Capacity to monitor and evaluate Forest Owlet populations and sharing of data on Forest Owlet.	1. Adequate skills for monitoring and evaluating Forest Owlet populations among the Forest Department staff	There are no skills for monitoring or evaluating Forest Owlet populations among the Forest Department staff.	0	1	2	The ability of Forest Department field staff to identify Forest Owlet through calls and sightings differs across sites and individuals. It is essential that most staff especially Forest Guards are trained to identify calls and also the bird, to ensure regular monitoring in their respective jurisdictions. They can serve as primary sources of information on the presence of the Forest Owlet for monitoring purposes as well as for information on new locations. Workshops on capacity building for this should be initiated at all presence sites. Basic monitoring at the beat or range level can be set up (akin to Tiger monitoring) by the Forest Department. A database of daily/weekly sightings can be set up in Forest Department portals, at each of the Forest Owlet sites. The information collected can be shared through collaborations with NGOs or researchers.	Medium
		Some skills exist but are insufficient to provide robust information on Forest Owlet and their conservation status in the region.	1				
		Field skills for effective monitoring of Forest Owlet from calls and sightings exist.	2				
		Necessary skills exist for effective monitoring, analysis and evaluation of Forest Owlet population and status.	3				
	2. Inclusion of monitoring and evaluation of Forest Owlet populations in the agenda of the Forest Department	There is no focus on monitoring and evaluation of Forest Owlet populations in the agenda of the Forest Department.	0	2	3	Forest Owlet populations are monitored through research projects and surveys. It is essential to have regular monitoring of populations through annual surveys using standardised protocols so that information can be compared across locations and time. This should be done outside and inside PAs. Additional potential areas should be surveyed based on periodic updating of predictive distribution maps.	High
		Forest Owlet is monitored only during annual census exercises but not in a systematic manner.	1				
		Forest Owlet population is monitored and evaluated in some regions of its known distribution but not all.	2				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
		There is a well-planned monitoring and evaluation system focussing on Forest Owlet within the agenda of the Forest Department.	3				
	3. Sharing of data/knowledge and co-operation between NGO's and Forest Department regarding Forest Owlet presence and monitoring.	There is no sharing of data between various agencies.	0	3	3	There is a strong partnership between the Forest Department and some NGOs who are conducting research on the species since several years. A greater interaction between NGOs and Forest Department is needed to create trust and partnerships. This will especially benefit outreach/education/awareness.	Medium
		There is informal sharing of data between the Forest Department and NGO's regarding Forest Owlet.	1				
		Data sharing is a one way process where only the NGO's share their data with the Forest Department.	2				
		The Forest Department and NGO's work together to generate and share data on Forest Owlet inside and outside PA's	3				
	4.Sharing of knowledge between Forest Department/NGO's with local communities regarding Forest Owlet.	There is no special effort made to share information with locals on Forest Owlet	0	0	3	A sustained interaction with the Forest Department would inculcate trust in the Forest Department among the locals. These can be achieved through regular/monthly meetings between Forest Department, NGOs local panchayats and communities; awareness workshops for protected area staff, NGOs, local field guides; important one-day events (such as Owlet day); school-based education curriculum - Talks, Nature walks; training	High
		Some effort is made to share information on Forest Owlet with locals but this is not sufficient.	1				
		Information on Forest Owlet is shared with locals but they are not involved in Forest Owlet monitoring programs.	2				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
		Locals are made aware of Forest Owlet and are actively involved in Forest Owlet population monitoring programs by the NGO's and Forest Department.	3			for citizen science activities; nature camps especially for tribal children living in Forest Owlet habitats & further train them as potential "Forest Owlet watchers"; creation of a platform for interaction/engagement between multiple stakeholders - such as owl festival; festivals like Mowgli Utsav (Madhya Pradesh) targeted towards school children; local community based monitoring initiatives- farmers as potential Forest Owlet spotters.	
	5.Sharing of data/exchange information on Forest Owlet between the larger research/academic community	There are no efforts made to exchange information on Forest Owlet among the larger research community.	0	2	3	Most information available on the species is through published literature and popular articles. Many small studies and surveys have not been communicated over publications. There is a requirement for exchange of new information from ongoing studies through seminars, meetings and networking. This can foster trust as well collaborations. This could be achieved through creating a Forest Owlet Research and Conservation network.	High
		Information sharing is largely through publications in peer reviewed journals and popular articles.	1				
		There is some effort to exchange information among the larger research community apart from available literature, but only on request.	2				
		Information on Forest Owlet is exchanged among the larger research community through reports, publications, commons data base and meetings, on a regular basis.	3				
Enforcement and Patrolling	1. Capacity to tackle and reduce	The presence of the Forest Department outside the PA is very poor	0	2	3	Though the Forest Department has a presence outside the PA, certain issues such as diversion of land for	High

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
	threats outside PAs.	Although there is a presence of the Forest Department outside PAs (and since Forest Owlet is protected under the Indian Wildlife Protection Act), there is little that the Forest Department can do outside PAs	1			developmental purposes, usage of pesticides and rodenticides, among others, cannot be addressed by the Forest Department alone. For this, it is essential to rope in locals and Line Departments into conservation activities through awareness workshops and linking Forest Owlet conservation in specific policies of Line Departments. For example, one way would be to periodically review land regimes and policies of Line Departments in the localities where Forest Owlet is present and hold subsequent interactions/meetings and collaborations of Forest Departments, researchers and Line Departments.	
		If made aware of the threats, the Forest Department has the capacity to tackle some cases e.g. poaching but not all threats can be managed by the Forest Department alone e.g. land policies.	2				
		The Forest Department is well equipped to handle most threats to Forest Owlet in collaboration with other Line Departments and local communities.	3				
	2. Line Departments are co-operative and willing to participate in Forest Owlet conservation outside PA's	Line Departments are not concerned about Forest Owlet conservation.	0	1	3	It is essential to mainstream Forest Owlet Conservation outside PAs into the policies of the Line Departments and make them aware of the significance of the bird. This can be achieved through awareness workshops, pamphlets and involvement of Line Departments in activities that highlight the species such as Forest Owlet Conservation Day, Owl Festival, outreach activities for Tribal children, among others.	High
		There has been no effort made to mainstream Forest Owlet conservation outside PAs in the plans of the Line Departments.	1				
		There have been some efforts to interact with Line Departments and mainstream Forest Owlet conservation outside PAs but this is not enough.	2				
		Forest Owlet conservation outside PAs is mainstreamed in the plans of the Line Departments through regular interactions and sharing of information.	3				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
TOTAL SCORE			**42**	**21**	**41**		
				50%	98%		

Madhya Pradesh

Strategic Area	Issue	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
Information gap	1. Existing information on presence and distribution of Forest Owlet in the region.	There is some general scattered information on the presence and distribution of Forest Owlet but needs additional updates.	0	1	3	A standardised monitoring protocol should be used for grid level information (e.g. randomly picked 1*1 km sampling grid cells) across the species range. This could be used for occupancy based analysis as well as for density estimates if the birds are marked/ringed. Other information on habitats based on hypotheses should also be collected periodically. This needs regular (annual) monitoring for long-term estimates and trends in distribution and population level information. Similar surveys should be carried out in areas that are potential habitats (as predicted through niche/habitat/distribution models) but with no current records of the species. Areas surrounding known locations which have similar forest cover and composition should also be surveyed for the presence of the species.	High
		Information on Forest Owlet presence and distribution exits at the range level.	1				
		Information on Forest Owlet presence and distribution exits at the beat level.	2				
		Information on Forest Owlet presence and distribution exits through systematic grid-based sampling with standardised protocols which can be used for determining and comparing presence and occupancy estimates for long-term monitoring purposes.	3				
	2. Understanding threats to Forest Owlet in the region.	Threats to Forest Owlet in the region (inside and outside PA's) is largely speculative without adequate data.	0	1	3	General threats to the Forest Owlet are known but a measure of their impact on Forest Owlet populations is urgently required. Threats need to be documented, monitored for updating and measured. This is especially relevant to threats such as habitat degradation and pesticide use which are on the rise. A workshop for Forest Staff for managed forests in the	High
		Threats to Forest Owlet in the region are known but not measured	1				
		Some threats to Forest Owlet in the region (inside and outside PA's) are known and measured but not all threats are understood	2				

Strategic Area	Issue	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
		All threats to Forest Owlet in the region are understood, measured and documented.	3			Khandwa Circle was conducted by WRCS in 2015 to protect nest trees. The report contained an Action Plan where details of actions to be taken to protect nest trees/cavities and address other threats were outlined. Such activities should be built into the Working Plan of managed forests.	
	3. Understanding the ecology of Forest Owlet (population size habitat, diet, breeding biology, movement patterns, longevity etc.)	There is no information available on the ecology of Forest Owlet in the region.	0	1	3	Information gaps exist on population size/abundance, habitat requirements, nesting requirements, habitat and population connectivity, disease, genetic diversity, among others. Studies addressing these are urgently required at all sites of occurrence with regular/annual monitoring especially of population trends and status of habitat.	High
		There is some information available on the ecology of Forest Owlet but this is inadequate.	1				
		Ecological aspects of Forest Owlet are well documented but only in some areas.	2				
		Adequate knowledge on the ecology of Forest Owlet is available to plan their conservation.	3				
Awareness and recognition of Forest Owlet	1. Awareness on the presence of Forest Owlet in PA and outside, their legal status and capacity to identify Forest Owlet, among Forest Department Staff	The Forest Department staff are not aware of Forest Owlet in their landscape or of its legal status.	0	2	3	It is essential that most staff especially Forest Guards are trained to identify calls and also the bird to ensure regular monitoring in their respective jurisdictions. They can serve as the primary sources of information on the presence of the Forest Owlet for monitoring purposes as well as information on new locations. Workshops on capacity building for this should be initiated at all presence sites, including managed forests.	Medium
		The Forest Department staff are aware of the presence of Forest Owlet in their landscape and its legal status but are not able to identify the bird visually or by its calls.	1				
		Some Forest Department staff are aware of Forest Owlet in their landscape, its legal status and are able to identify the bird visually or by its calls.	2				
		All Forest Department staff are aware of the Forest Owlet in their landscape, its legal status and can identify the bird visually and by its calls.	3				

Strategic Area	Issue	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
	2. Awareness on the presence of Forest Owlet, capacity to identify Forest Owlet, knowledge of habits of Forest Owlet and ability to identify them, among local communities.	The locals have no knowledge on Forest Owlet in their landscapes	0	2	3	All target groups should be well-represented (e.g. schools, colleges, women, urban and rural public). A higher level of communication is required between researchers and outreach groups to spread knowledge on the Forest Owlet and its biology to citizens. Citizens can be involved in gathering information on Forest Owlet presence and trends over years akin to other Citizen Science programs in the country.	High
		Locals are aware of the presence and general habits of Forest Owlet in their landscape and its legal status but cannot identify it.	1				
		Some locals are aware of Forest Owlet in their landscape, its general habits and legal status and can identify it, but this does not apply to most.	2				
		Most locals are aware of Forest Owlet in their landscapes, their habits and legal status and can and can identify them.	3				
	3. Awareness among NGOs working on wildlife and conservation related issues on the presence of Forest Owlet in the region, its legal status, general habits and habitat associations.	Local NGO's working on wildlife and conservation related issues have no knowledge on Forest Owlet in their landscape	0	2	3	A list of NGOs working on biodiversity conservation issues and tribal welfare should be prepared and they should be involved in activities pertaining to Forest Owlet Conservation.	Medium
		Local NGO's working on wildlife and conservation related issues are aware of the presence of Forest Owlet in their landscape but are unaware of its legal status or habits and habitat associations.	1				
		Some local NGO's working on wildlife and conservation related issues are aware of the presence of Forest Owlet in their landscape, its legal status, general habits and habitat associations.	2				
		All local NGO's working on wildlife and conservation related issues are aware of the presence of Forest Owlet in their landscape, its legal status, general habits and habitat associations.	3				

Strategic Area	Issue	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
	4. Awareness among other administrative/Line Departments in the region on the presence of Forest Owlet inside and outside PA's.	Line Departments functioning in the region have no knowledge on Forest Owlet in their landscape	0	0	3	There is perhaps not enough awareness regarding the species among Line Department personnel in the districts where the bird occurs. Since the habitat of the species also occurs outside PAs and transcends into other land regimes with separate jurisdictions and rules, it is pertinent to spread awareness among Line Department personnel who control such land. For example, surveys and studies have found a strong association with Forest Owlet presence and agricultural fields. The agriculture and horticulture departments should be roped into the conservation schemes, especially related to the kind of agricultural practices and use of pesticides. The evaluation summaries on threats can be used to identify such Line Departments. Awareness workshops, reading material and other activities can be planned to involve Line Departments in conserving the Forest Owlet.	High
		Line Departments in the region are aware of Forest Owlet in their landscape but are not aware of its legal status or habits and habitat associations.	1				
		Some Line Departments in the region are aware of the legal status and conservation requirements of Forest Owlet in their landscape but not all.	2				
		All Line Departments in the region are aware of the legal status and conservation requirements of Forest Owlet in their landscape.	3				
Capacity to monitor and evaluate Forest Owlet populations and sharing of data on Forest Owlet.	1. Adequate skills for monitoring and evaluating Forest Owlet populations among the Forest Department staff	There are no skills for monitoring or evaluating Forest Owlet populations among the Forest Department staff.	0	1	2	It is essential that most staff especially Forest Guards are trained to identify calls and also the bird, to ensure regular monitoring in their respective jurisdictions. They can serve as primary sources of information on the presence of the Forest Owlet for monitoring purposes as well as for information on new locations. A workshop on monitoring nest sites	High
		Some skills exist but are insufficient to provide robust information on Forest Owlet and their conservation status in the region.	1				
		Field skills for effective monitoring of Forest Owlet from calls and sightings exist.	2				

Strategic Area	Issue	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
		Necessary skills exist for effective monitoring, analysis and evaluation of Forest Owlet population and status.	3			was conducted by WRCS, Pune in 2015 for manged forests in the Khandwa Circle and similar workshops on other aspects including population monitoring should be initiated at all presence sites. An Action Plan was also prepared by WRCS during the workshop and details of actions to be taken to protect nest trees/cavities and address other threats were outlined. Basic monitoring at the beat or range level can be set up (akin to Tiger monitoring) by the Forest Department. A database of daily/weekly sightings can be set up in Forest Department portals, at each of the Forest Owlet sites. The information collected can be shared through collaborations with NGOs or researchers.	
	2. Inclusion of monitoring and evaluation of Forest Owlet populations in the agenda of the Forest Department	There is no focus on monitoring and evaluation of Forest Owlet populations in the agenda of the Forest Department.	0	2	3	Forest Owlet populations are monitored through research projects and surveys. It is essential to have regular monitoring of populations through annual surveys using standardised protocols so that information can be compared across locations and time. This should be done outside and inside PAs. Additional potential areas should be surveyed based on periodic updating of predictive distribution maps.	High
		Forest Owlet is monitored only during annual census exercises but not in a systematic manner.	1				
		Forest Owlet population is monitored and evaluated in some regions of its known distribution but not all.	2				
		There is a well-planned monitoring and evaluation system focussing on Forest Owlet within the agenda of the Forest Department.	3				

Strategic Area	Issue	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
	3. Sharing of data/knowledge and co-operation between NGO's and Forest Department regarding Forest Owlet presence and monitoring.	There is no sharing of data between various agencies.	0	3	3	There is a strong partnership between the Forest Department and some NGOs who are conducting research on the species since several years. A workshop on training Forest Staff to monitor nest sites was held in 2015 by WRCS, Pune and several recommendations for outreach and threat reduction through capacity building exercises were discussed. Such activities need to be sustained as they especially benefit outreach/education/awareness and overall threat reduction.	Medium
		There is informal sharing of data between the Forest Department and NGO's regarding Forest Owlet.	1				
		Data sharing is a one way process where only the NGO's share their data with the Forest Department.	2				
		The Forest Department and NGO's work together to generate and share data on Forest Owlet inside and outside PA's	3				
	4.Sharing of knowledge between Forest Department/NGO's with local communities regarding Forest Owlet.	There is no special effort made to share information with locals on Forest Owlet	0	2	3	A sustained interaction with the Forest Department would inculcate trust in the Forest Department among the locals. These can be achieved through regular/monthly meetings between Forest Departments, NGOs local panchayats and communities; awareness workshops for protected area staff, NGOs, local field guides; important one-day events (such as Owlet day); school-based education curriculum - Talks, Nature walks; training for citizen science activities; nature camps especially for tribal children living in Forest Owlet habitats & further train them as potential “Forest Owlet watchers”; creation of a platform for interaction/engagement between multiple stakeholders - such as owl festival; festivals like Mowgli Utsav (Madhya Pradesh) targeted towards school children; local community	High
		Some effort is made to share information on Forest Owlet with locals but this is not sufficient.	1				
		Information on Forest Owlet is shared with locals but they are not involved in Forest Owlet monitoring programs.	2				
		Locals are made aware of Forest Owlet and are actively involved in Forest Owlet population monitoring programs by the NGO's and Forest Department.	3				

Strategic Area	Issue	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
						based monitoring initiatives- farmers as potential Forest Owlet spotters.	
	5.Sharing of data/exchange information on Forest Owlet between the larger research/academic community	There are no efforts made to exchange information on Forest Owlet among the larger research community.	0	2	3	Most information available on the species is through published literature and popular articles. There is a requirement for exchange of new information from ongoing studies through seminars, meetings and networking. This can foster trust as well collaborations. This could be achieved through creating a Forest Owlet Research and Conservation network.	High
		Information sharing is largely through publications in peer reviewed journals and popular articles.	1				
		There is some effort to exchange information among the larger research community apart from available literature, but only on request.	2				
		Information on Forest Owlet is exchanged among the larger research community through reports, publications, commons data base and meetings, on a regular basis.	3				
Enforcement and Patrolling	1. Capacity to tackle and reduce threats outside PAs.	The presence of the Forest Department outside the PA is very poor	0	2	3	Though the Forest Department has a presence outside PAs, certain issues such as diversion of land for developmental purposes, usage of pesticides and rodenticides, among others, cannot be addressed by the Forest Department alone. For this, it is essential to rope in locals and Line Departments into conservation	High
		Although there is a presence of the Forest Department outside PAs (and since Forest Owlet is protected under the Indian Wildlife Protection Act), there is little that the Forest Department can do outside PAs	1				

Strategic Area	Issue	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current score			
		If made aware of the threats, the Forest Department has the capacity to tackle some cases e.g. poaching but not all threats can be managed by the Forest Department alone e.g. land policies.	2			activities through awareness workshops and linking Forest Owlet conservation in specific policies of Line Departments. For example, one way would be to periodically review land regimes and policies of Line Departments in the localities where Forest Owlet is present and hold subsequent interactions/meetings and collaborations of Forest Departments, researchers and Line Departments.	
		The Forest Department is well equipped to handle most threats to Forest Owlet in collaboration with other Line Departments and local communities.	3				
	2. Line Departments are co-operative and willing to participate in Forest Owlet conservation outside PA's	Line Departments are not concerned about Forest Owlet conservation.	0	1	3	It is essential to mainstream Forest Owlet Conservation outside PAs into the policies of the Line Departments and make them aware of the significance of the bird. This can be achieved through awareness workshops, pamphlets and involvement of Line Departments in activities that highlight the species such as Forest Owlet Conservation Day, Owl Festival, outreach activities for Tribal children, among others.	High
		There has been no effort made to mainstream Forest Owlet conservation outside PAs in the plans of the Line Departments.	1				
		There have been some efforts to interact with Line Departments and mainstream Forest Owlet conservation outside PAs but this is not enough.	2				
		Forest Owlet conservation outside PAs is mainstreamed in the plans of the Line Departments through regular interactions and sharing of information.	3				
TOTAL SCORE			**42**	**22**	**41**		
				52%	98%		

Gujarat

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current Score			
Information gap	1. Existing information on presence and distribution of Forest Owlet in the region.	There is some general scattered information on the presence and distribution of Forest Owlet but needs additional updates.	0	1	3	Information on presence differs among locations and while certain areas are better studied e.g. Dangs RF and Purna WLS, other areas adjoining the Dang District in Valsad, Navsari Districts and connected UT of Dadra and Nagar Haveli and Daman and Diu, need intensive surveys to determine the status and new locations for the species. A standardised monitoring protocol should be used for grid level information (e.g. randomly picked 1*1 km sampling grid cells) across the species range. This needs regular (annual) monitoring for long-term estimates and trends in distribution and population level information. Similar surveys should be carried out in areas that are potential habitats (as predicted through niche/habitat/distribution models) but with no current records of the species. Areas surrounding known locations which have similar forest cover and composition should also be surveyed for the presence of the species.	High
		Information on Forest Owlet presence and distribution exits at the range level.	1				
		Information on Forest Owlet presence and distribution exits at the beat level.	2				
		Information on Forest Owlet presence and distribution exits through systematic grid-based sampling with standardised protocols which can be used for determining and comparing presence and occupancy estimates for long-term monitoring purposes.	3				
	2. Understanding threats to Forest Owlet in the region.	Threats to Forest Owlet in the region (inside and outside PA's) are largely speculative without adequate data.	0	1	3	General threats to the Forest Owlet are known but a measure of their impact on Forest Owlet populations is urgently required. Threats need to be documented, monitored for updating and measured. This is especially relevant to threats such as habitat degradation, developmental activities	High
		Threats to Forest Owlet in the region are known but not measured	1				
		Some threats to Forest Owlet in the region (inside and outside PA's) are	2				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current Score			
		known and measured but not all threats are understood				and pesticide use which are on the rise as a general trend.	
		All threats to Forest Owlet in the region are understood, measured and documented.	3				
	3. Understanding the ecology of Forest Owlet (population size habitat, diet, breeding biology, movement patterns, longevity etc.)	There is no information available on the ecology of Forest Owlet in the region.	0	1	3	There have been several surveys for the Forest Owlet in the Dangs RF and Purna WLS, including occupancy analysis, since its discovery in 2015. However, additional areas of potential presence of the species need to be surveyed and monitored urgently, especially in Valsad and Navsari districts. Information gaps exist on population size/abundance, habitat requirements, nesting requirements, habitat and population connectivity, disease, genetic diversity, among others. Studies addressing these are urgently required at all sites of occurrence with regular/annual monitoring especially of population trends and status of habitat.	High
		There is some information available on the ecology of Forest Owlet but this is inadequate.	1				
		Ecological aspects of Forest Owlet are well documented but only in some areas .	2				
		Adequate knowledge on the ecology of Forest Owlet is available to plan their conservation.	3				
Awareness and recognition of Forest Owlet	1. Awareness on the presence of Forest Owlet in PA and outside, their legal status and capacity to identify Forest Owlet, among Forest Department Staff	The Forest Department staff are not aware of Forest Owlet in their landscape or of its legal status.	0	2	3	It is essential that most staff especially Forest Guards are trained to identify calls and also the bird to ensure regular monitoring in their respective jurisdictions. They can serve as the primary sources of information on the presence of the Forest Owlet for monitoring purposes as well as information on new locations. Workshops on capacity building for this should be initiated at all presence sites.	Medium
		The Forest Department staff are aware of the presence of Forest Owlet in their landscape and its legal status but are not able to identify the bird visually or by its calls.	1				
		Some Forest Department staff are aware of Forest Owlet in their landscape, its legal status and are able to identify the bird visually or by its calls.	2				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current Score			
		All Forest Department staff are aware of the Forest Owlet in their landscape, its legal status and can identify the bird visually and by its calls.	3				
	2. Awareness on the presence of Forest Owlet, capacity to identify Forest Owlet, knowledge of habits of Forest Owlet and ability to identify them, among local communities.	The locals have no knowledge on Forest Owlet in their landscapes	0	2	3	Locals who live in areas where Forest Owlet is present, especially farmers are knowledgeable about the Forest Owlet and it's behaviour/habits. However, outreach should be expanded to others living around Forest Owlet habitat as well and locals who are knowledgeable should be involved in outreach activities as resource people. At present, there are no continuous/sustained outreach and education programs and there is an urgent need for long-term outreach and education. Not all target groups are reached equally or are well-represented (e.g. schools, colleges, women, urban and rural public). A higher level of communication is required between researchers and outreach groups to spread knowledge on the Forest Owlet and its biology to citizens. Citizens, especially locals living in Forest Owlet habitats, can be involved in gathering information on Forest Owlet presence and trends over years akin to other Citizen Science programs in the country.	High
		Locals are aware of the presence and general habits of Forest Owlet in their landscape and its legal status but cannot identify it.	1				
		Some locals are aware of Forest Owlet in their landscape, its general habits and legal status and can identify it, but this does not apply to most.	2				
		Most locals are aware of Forest Owlet in their landscapes, their habits and legal status and can and can identify them.	3				
	3. Awareness among NGOs working on wildlife and conservation related issues on	Local NGO's working on wildlife and conservation related issues have no knowledge on Forest Owlet in their landscape	0	3	3	The Forest Owlet, is a well-known species among wildlife enthusiasts, and NGOs working on Wildlife and Conservation related issues would be aware of the Forest Owlet and its legal	Medium

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current Score			
	the presence of Forest Owlet in the region, its legal status, general habits and habitat associations.	Local NGO's working on wildlife and conservation related issues are aware of the presence of Forest Owlet in their landscape but are unaware of its legal status or habits and habitat associations.	1			status. However, apart from a few NGOs actively involved in research, many are not aware of the requirement for obtaining crucial ecological information on the species. There is a need to spread awareness regarding research using modern tools, since the available information on the species is obtained through systematic research efforts.	
		Some local NGO's working on wildlife and conservation related issues are aware of the presence of Forest Owlet in their landscape, its legal status, general habits and habitat associations.	2				
		All local NGO's working on wildlife and conservation related issues are aware of the presence of Forest Owlet in their landscape, its legal status, general habits and habitat associations.	3				
	4. Awareness among other administrative/Line Departments in the region on the presence of Forest Owlet inside and outside PA's.	Line Departments functioning in the region have no knowledge on Forest Owlet in their landscape	0	0	3	Although the Forest Owlet and its rarity is well known among conservation circles and birding enthusiasts even in the general public, there is perhaps not enough awareness regarding the species among Line Department personnel in the districts where the bird occurs. Since the habitat of the species also occurs outside PAs and transcends into other land regimes with separate jurisdictions and rules, it is pertinent to spread awareness	High
		Line Departments in the region are aware of Forest Owlet in their landscape but are not aware of its legal status or habits and habitat associations.	1				
		Some Line Departments in the region are aware of the legal status and conservation requirements of Forest Owlet in their landscape but not all.	2				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current Score			
		All Line Departments in the region are aware of the legal status and conservation requirements of Forest Owlet in their landscape.	3			among Line Department personnel who control such land. For example, surveys and studies have found a strong association with Forest Owlet presence and agricultural fields. The agriculture and horticulture departments should be roped into the conservation schemes, especially related to the kind of agricultural practices and use of pesticides. The evaluation summaries on threats can be used to identify such Line Departments. Awareness workshops, reading material and other activities can be planned to involve Line Departments in conserving the Forest Owlet.	
Capacity to monitor and evaluate Forest Owlet populations and sharing of data on Forest Owlet.	1. Adequate skills for monitoring and evaluating Forest Owlet populations among the Forest Department staff	There are no skills for monitoring or evaluating Forest Owlet populations among the Forest Department staff.	0	1	2	It is essential that most staff especially Forest Guards are trained to identify calls and also the bird, to ensure regular monitoring in their respective jurisdictions. They can serve as primary sources of information on the presence of the Forest Owlet for monitoring purposes as well as for information on new locations. Workshops on capacity building for this should be initiated at all presence sites. Basic monitoring at the beat or range level can be set up (akin to Tiger monitoring) by the Forest Department. A database of daily/weekly sightings can be set up in Forest Department portals, at each of the Forest Owlet sites. The information collected can be shared through collaborations with NGOs or researchers.	Medium
		Some skills exist but are insufficient to provide robust information on Forest Owlet and their conservation status in the region.	1				
		Field skills for effective monitoring of Forest Owlet from calls and sightings exist.	2				
		Necessary skills exist for effective monitoring, analysis and evaluation of Forest Owlet population and status.	3				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current Score			
	2. Inclusion of monitoring and evaluation of Forest Owlet populations in the agenda of the Forest Department	There is no focus on monitoring and evaluation of Forest Owlet populations in the agenda of the Forest Department.	0	2	3	Forest Owlet populations are monitored through research projects and surveys. It is essential to have regular monitoring of populations through annual surveys using standardised protocols so that information can be compared across locations and time. This should be done outside and inside PAs. Additional potential areas should be surveyed based on periodic updating of predictive distribution maps.	High
		Forest Owlet is monitored only during annual census exercises but not in a systematic manner.	1				
		Forest Owlet population is monitored and evaluated in some regions of its known distribution but not all.	2				
		There is a well-planned monitoring and evaluation system focussing on Forest Owlet within the agenda of the Forest Department.	3				
	3. Sharing of data/knowledge and co-operation between NGO's and Forest Department regarding Forest Owlet presence and monitoring.	There is no sharing of data between various agencies.	0	3	3	The Forest Department and, researchers working on Forest Owlet share information. A greater interaction between NGOs and Forest Department is needed to create trust and partnerships. This will especially benefit outreach/education/awareness.	Medium
		There is informal sharing of data between the Forest Department and NGO's regarding Forest Owlet.	1				
		Data sharing is a one way process where only the NGO's share their data with the Forest Department.	2				
		The Forest Department and NGO's work together to generate and share data on Forest Owlet inside and outside PA's	3				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current Score			
	4.Sharing of knowledge between Forest Department/NGO's with local communities regarding Forest Owlet.	There is no special effort made to share information with locals on Forest Owlet	0	0	3	A sustained interaction with the Forest Department would inculcate trust in the Forest Department among the locals. These can be achieved through monthly meetings between Forest Departments, NGOs local panchayats and communities; awareness workshops for protected area staff, NGOs, local field guides; important one-day events (such as Owlet day); school-based education curriculum - Talks, Nature walks; training for citizen science activities; nature camps especially for tribal children living in Forest Owlet habitats & further train them as potential “Forest Owlet watchers”; creation of a platform for interaction/engagement between multiple stakeholders - such as owl festival; festivals like Mowgli Utsav (Madhya Pradesh) targeted towards school children; local community based monitoring initiatives- farmers as potential Forest Owlet spotters. Locals in the Dangs region who live in Forest Owlet habitats are very well versed with the habits and behaviour of the species and should be included as resource persons in outreach programs.	High
		Some effort is made to share information on Forest Owlet with locals but this is not sufficient.	1				
		Information on Forest Owlet is shared with locals but they are not involved in Forest Owlet monitoring programs.	2				
		Locals are made aware of Forest Owlet and are actively involved in Forest Owlet population monitoring programs by the NGO's and Forest Department.	3				
	5.Sharing of data/exchange information on Forest Owlet between the larger research/academic community	There are no efforts made to exchange information on Forest Owlet among the larger research community.	0	2	3	Most information available on the species is through published literature and popular articles. Many small studies and surveys have not been communicated over publications. There is a requirement for exchange of new information from ongoing studies	High
		Information sharing is largely through publications in peer reviewed journals and popular articles.	1				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current Score			
		There is some effort to exchange information among the larger research community apart from available literature, but only on request.	2			through seminars, meetings and network. This can foster trust as well collaborations. This could be achieved through creating a Forest Owlet Research and Conservation network.	
		Information on Forest Owlet is exchanged among the larger research community through reports, publications, commons data base and meetings, on a regular basis.	3				
Enforcement and Patrolling	1. Capacity to tackle and reduce threats outside PAs.	The presence of the Forest Department outside the PA is very poor	0	2	3	Though the Forest Department has a presence outside the PA, certain issues such as diversion of land for developmental purposes, usage of pesticides and rodenticides, among others, cannot be addressed by the Forest Department alone. For this, it is essential to rope in locals and Line Departments into conservation activities through awareness workshops and linking Forest Owlet conservation in specific policies of Line Departments. For example, one way would be to periodically review land regimes and policies of Line Departments in the localities where Forest Owlet is present and hold subsequent interactions/meetings and collaborations of Forest Departments, researchers and Line Departments.	High
		Although there is a presence of the Forest Department outside PAs (and since Forest Owlet is protected under the Indian Wildlife Protection Act), there is little that the Forest Department can do outside PAs	1				
		If made aware of the threats, the Forest Department has the capacity to tackle some cases e.g. poaching but not all threats can be managed by the Forest Department alone e.g. land policies.	2				
		The Forest Department is well equipped to handle most threats to Forest Owlet in collaboration with other Line Departments and local communities.	3				
	2. Line Departments are co-operative and willing to participate in Forest Owlet	Line Departments are not concerned about Forest Owlet conservation.	0	1	3	It is essential to mainstream Forest Owlet Conservation outside PAs into the policies of the Line Departments and make them aware of the significance of the bird. This can be achieved through awareness workshops, pamphlets and	High
		There has been no effort made to mainstream Forest Owlet conservation outside PAs in the plans of the Line Departments.	1				

Strategic Area	Issue/Gaps	Outcome Indicators	Baseline Score		Target Score	Evaluative Comments for the Score	Priority
			Reference Score	Current Score			
	conservation outside PA's	There have been some efforts to interact with Line Departments and mainstream Forest Owlet conservation outside PAs but this is not enough.	2			involvement of Line Departments in activities that highlight the species such as Forest Owlet Conservation Day, Owl Festival, outreach activities for Tribal children, among others.	
		Forest Owlet conservation outside PAs is mainstreamed in the plans of the Line Departments through regular interactions and sharing of information.	3				
TOTAL SCORE			**42**	**22**	**41**		
				52%	98%		

Appendix-III: State-wise Priority Recommendations for Actions with expected Outputs

Maharashtra

Research

Recommendations	Priority Level	Expected Outputs
Enhance information on Forest Owlet presence	High	Information on Forest Owlet at the grid level from current known locations with annual updates
	High	Surveys initiated in potential sites for new populations/locations
	Medium	Updated presence maps for Forest Owlet
Enhance information on threats to Forest Owlet and its habitat	High	Documentation of threats through research projects
	High	Threats measured, monitored and information updated annually
Enhance information on the ecology of Forest Owlet	High	Information generated and updated on population size, habitat requirements, nesting requirements, habitat and population connectivity, disease, genetic diversity, and other ecological aspects, covering all sites of presence of the species, through several research projects.
	High	Annual updates on population trends and status of habitat
	High	New techniques for studying, surveying and monitoring the species and habitat, standardised
	Medium	Citizens and forest departments involved in research activities and increase in research output
Exchange scientific information among researchers, Forest Department and other stakeholders	High	Best practice guides and manuals detailing standardised methods for research
	High	Publications in peer reviewed journals
	High	Popular articles in magazines and newspapers in Marathi, Hindi and English
	Medium	A formal working group to share information, funding opportunities and updates
	Low	Regular seminars to share research information with stakeholders
	Low	A virtual platform for data sharing created

Policy

Recommendations	Priority Level	Expected Outputs
Strengthen skills in frontline Forest Department staff to address conservation issues related to Forest Owlet	High	Enhanced skills of frontline staff of Forest Department to address threats inside and outside PAs
	Medium	Annual workshops for enhanced awareness and professional skills of frontline staff of Forest Department in identifying and monitoring Forest Owlet
Enhance awareness regarding Forest Owlet in Line Departments	High	Awareness materials produced such as pamphlets and posters to be distributed among Line Department personnel
	Medium	Involvement of Line Department personnel in public activities related to Forest Owlet conservation such as celebration of Forest Owlet day, Wildlife Week celebrations etc.
	Low	Annual workshops for generating awareness regarding the Forest Owlet and conservation issues among Line Department personnel
Include Forest Owlet monitoring in Forest Department Agenda	High	Database portal set up in Forest Department for daily/weekly sighting records
	Medium	Collaborative monitoring exercises with all stakeholders (Forest Departments, NGOs, researchers and locals/citizen volunteers)
Integrate Forest Owlet conservation into Forest Department Management Plans	High	Species Recovery Plan designed and updated regularly
	High	Systematic Conservation Planning exercise to identify areas for enhanced conservation attention
	High	Incorporation of research information into Management and Conservation Plans
	Medium	Incorporation of research information into Working Plans of managed forests
Increase protection for Forest Owlet	High	Forest Owlet sites identified for inclusion into the PA network
	High	Forest Owlet sites identified for inclusion into IBAs
	High	Key subpopulations identified for increased conservation focus
	High	Local communities involved in Forest Owlet conservation through innovative solutions and incentives like ecotourism, compensations for opportunity costs
	Medium	Mainstream Forest Owlet conservation outside PAs through involvement of key Line Departments

Outreach

Recommendations	Priority Level	Expected Outputs
Improve skills and capacity among locals communities and other citizens	High	Regular nature camps for tribal children living in Forest Owlet habitats to further train them as potential “Forest Owlet watchers”
	High	Involvement of locals and other citizens in research activities
	Medium	Long-term education programs tailored to each stakeholder designed
	Low	General training workshops for citizen science activities initiated (this is apart from specific ones held under research projects)
Exchange information among stakeholders	High	Locals made aware of Forest Owlet and actively involved in Forest Owlet population monitoring programs
	High	Popular articles on Forest Owlet in Marathi, Hindi and English
	Medium	Appropriate material such as games, books and posters designed for target audience, created
	Medium	Greater interaction and feedback between on-ground researchers, outreach groups and other stakeholders, established through seminars, meetings and other platforms

Madhya Pradesh

Research

Recommendations	Priority Level	Expected Outputs
Enhance information on Forest Owlet presence	High	Information on Forest Owlet at the grid level from current known locations with annual updates
	High	Surveys initiated in potential sites for new populations/locations
	Medium	Updated presence maps for Forest Owlet
Enhance information on threats to Forest Owlet and its habitat	High	Documentation of threats through research projects
	High	Threats measured, monitored and information updated annually
Enhance information on the ecology of Forest Owlet	High	Information generated and updated on population size, habitat requirements, nesting requirements, habitat and population connectivity, disease, genetic diversity, and other ecological aspects, covering all sites of presence of the species, through several research projects.
	High	Annual updates on population trends and status of habitat
	High	New techniques for studying, surveying and monitoring the species and habitat, standardised
	Medium	Citizens and forest departments involved in research activities and increase in research output
Exchange scientific information among researchers, Forest Department and other stakeholders	High	Best practice guides and manuals detailing standardised methods for research
	High	Publications in peer reviewed journals
	High	Popular articles in magazines and newspapers in Hindi and English
	Medium	A formal working group to share information, funding opportunities and updates
	Low	Regular seminars to share research information with stakeholders
	Low	A virtual platform for data sharing created

Policy

Recommendations	Priority Level	Expected Outputs
Strengthen skills in frontline Forest Department staff to address conservation issues related to Forest Owlet	High	Enhanced skills of frontline staff of Forest Department to address threats inside and outside PAs
	Medium	Annual workshops for enhanced awareness and professional skills of frontline staff of Forest Department in identifying and monitoring Forest Owlet
Enhance awareness regarding Forest Owlet in Line Departments	High	Awareness materials produced such as pamphlets and posters to be distributed among Line Department personnel
	Medium	Annual workshops for generating awareness regarding the Forest Owlet and conservation issues among Line Department personnel
	Low	Involvement of Line Department personnel in public activities related to Forest Owlet conservation such as celebration of Forest Owlet day, Wildlife Week celebrations etc.
Include Forest Owlet monitoring in Forest Department Agenda	High	Database portal set up in Forest Department for daily/weekly sighting records
	Medium	Collaborative monitoring exercises with all stakeholders (Forest Departments, NGOs, researchers and locals/citizen volunteers)
Integrate Forest Owlet conservation into Forest Department Management Plans	High	Species Recovery Plan designed and updated regularly
	High	Systematic Conservation Planning exercise to identify areas for enhanced conservation attention
	High	Incorporation of research information into Working Plans of managed forests
	High	Incorporation of research information into Management and Conservation Plans
Increase protection for Forest Owlet	High	Forest Owlet sites identified for inclusion into the PA network
	High	Local communities involved in Forest Owlet conservation through innovative solutions and incentives like ecotourism, compensations for opportunity costs
	High	Key subpopulations identified for increased conservation focus
	Medium	Forest Owlet sites identified for inclusion into IBAs
	Medium	Mainstream Forest Owlet conservation outside PAs through involvement of key Line Departments

Outreach

Recommendations	Priority Level	Expected Outputs
Improve skills and capacity among locals communities and other citizens	High	Regular nature camps for tribal children living in Forest Owlet habitats to further train them as potential “Forest Owlet watchers”
	Medium	Involvement of locals and other citizens in research activities
	Medium	Long-term education programs tailored to each stakeholder designed
	Low	General training workshops for citizen science activities initiated (this is apart from specific ones held under research projects)
Exchange information among stakeholders	High	Locals made aware of Forest Owlet and actively involved in Forest Owlet population monitoring programs
	High	Popular articles on Forest Owlet in Hindi and English
	Medium	Appropriate material such as games, books and posters designed for target audience, created
	Medium	Greater interaction and feedback between on-ground researchers, outreach groups and other stakeholders, established through seminars, meetings and other platforms

Gujarat

Research

Recommendations	Priority Level	Expected Outputs
Enhance information on Forest Owlet presence	High	Information on Forest Owlet at the grid level from current known locations with annual updates
	High	Surveys initiated in potential sites for new populations/locations
	Medium	Updated presence maps for Forest Owlet
Enhance information on threats to Forest Owlet and its habitat	High	Documentation of threats through research projects
	High	Threats measured, monitored and information updated annually
Enhance information on the ecology of Forest Owlet	High	Information generated and updated on population size, habitat requirements, nesting requirements, habitat and population connectivity, disease, genetic diversity, and other ecological aspects, covering all sites of presence of the species, through several research projects.
	High	Annual updates on population trends and status of habitat
	High	New techniques for studying, surveying and monitoring the species and habitat, standardised
	Medium	Citizens and forest departments involved in research activities and increase in research output
Exchange scientific information among researchers, Forest Department and other stakeholders	High	Best practice guides and manuals detailing standardised methods for research
	High	Publications in peer reviewed journals
	High	Popular articles in magazines and newspapers in Gujarati, Hindi and English
	Medium	A formal working group to share information, funding opportunities and updates
	Low	Regular seminars to share research information with stakeholders
	Low	A virtual platform for data sharing created

Policy

Recommendations	Priority Level	Expected Outputs
Strengthen skills in frontline Forest Department staff to address conservation issues related to Forest Owlet	High	Enhanced skills of frontline staff of Forest Department to address threats inside and outside PAs
	Medium	Annual workshops for enhanced awareness and professional skills of frontline staff of Forest Department in identifying and monitoring Forest Owlet
Enhance awareness regarding Forest Owlet in Line Departments	High	Awareness materials produced such as pamphlets and posters to be distributed among Line Department personnel
	Medium	Involvement of Line Department personnel in public activities related to Forest Owlet conservation such as celebration of Forest Owlet day, Wildlife Week celebrations etc.
	Low	Annual workshops for generating awareness regarding the Forest Owlet and conservation issues among Line Department personnel
Include Forest Owlet monitoring in Forest Department Agenda	High	Database portal set up in Forest Department for daily/weekly sighting records
	Medium	Collaborative monitoring exercises with all stakeholders (Forest Departments, NGOs, researchers and locals/citizen volunteers)
Integrate Forest Owlet conservation into Forest Department Management Plans	High	Species Recovery Plan designed and updated regularly
	High	Systematic Conservation Planning exercise to identify areas for enhanced conservation attention
	High	Incorporation of research information into Management and Conservation Plans
	High	Incorporation of research information into Working Plans of managed forests
Increase protection for Forest Owlet	High	Forest Owlet sites identified for inclusion into the PA network
	High	Forest Owlet sites identified for inclusion into IBAs
	High	Key subpopulations identified for increased conservation focus
	High	Local communities involved in Forest Owlet conservation through innovative solutions and incentives like ecotourism, compensations for opportunity costs
	Medium	Mainstream Forest Owlet conservation outside PAs through involvement of key Line Departments

Outreach

Recommendations	Priority Level	Expected Outputs
Improve skills and capacity among locals communities and other citizens	High	Regular nature camps for tribal children living in Forest Owlet habitats to further train them as potential “Forest Owlet watchers”
	High	Involvement of locals and other citizens in research activities
	Medium	Long-term education programs tailored to each stakeholder designed
	Low	General training workshops for citizen science activities initiated (this is apart from specific ones held under research projects)
Exchange information among stakeholders	High	Locals made aware of Forest Owlet and actively involved in Forest Owlet population monitoring programs
	High	Popular articles on Forest Owlet in Marathi, Hindi and English
	Medium	Appropriate material such as games, books and posters designed for target audience, created
	Medium	Greater interaction and feedback between on-ground researchers, outreach groups and other stakeholders, established through seminars, meetings and other platforms

Appendix-IV: List of Contributors

1. Dr. K. Sankar, Director, SACON, Coimbatore.
2. Dr. Himmat Singh Negi, Additional Principal Chief Conservator of Forests, Bhopal, Madhya Pradesh Forest Department.
3. Mr. L. Krishna Moorthy, Chief Conservator of Forests, Field Director, Satpura TR, Madhya Pradesh, Forest Department.
4. Mr. Uday Vora, Chief Conservator of Forests (Retd), Gujarat Forest Department.
5. Chief Conservator of Forests, Khandwa, Madhya Pradesh Forest Department.
6. Mr. Anil Anjankar, Conservator of Forests (Wildlife), Nashik, Maharashtra Forest Department.
7. Ms. Piyusha Jagtap, Deputy Conservator of Forests, Amravati, Maharashtra Forest Department.
8. Mr. Gaurav Chaudhary, Deputy Conservator of Forests, Burhanpur, Madhya Pradesh Forest Department.
9. Mr. Bhanudas Pingale, Deputy Conservator of Forest (Wildlife), Thane, Maharashtra Forest Department.
10. Mr. Bharat Shinde, Assistant Conservator of Forests (Wildlife), Nashik, Maharashtra Forest Department.
11. Ms. Madhumitha S., Assistant Conservator of Forests, Melghat TR, Maharashtra.
12. Mr. Kamlesh Patil, Assistant Conservator of Forest, Maharashtra Forest Department.
13. Dr. Prachi Mehta, Senior Scientist and Executive Director, Wildlife Research and Conservation Society (WRCS), Pune.
14. Dr. Girish Jathar, Assistant Director, Bombay Natural History Society, Mumbai.
15. Mr. Dharmaraj Patil, Head, Environment Program, Raintree Foundation.
16. Dr. Pankaj Koparde, Assistant Professor, MIT World Peace University, Pune.
17. Mr. Sunil Laad, President, Owl Conservation Foundation.
18. Mr. Jenis Patel, PhD student, Nature Conservation Foundation, Mysuru.
19. Mr. Kaushal Patel, Research Associate, WCS-India.
20. Dr. Pranav Trivedi, Consultant Nature Educator & Ecologist, Navsari, Gujarat.
21. Dr. Suhel Quader, Senior Scientist, Nature Conservation Foundation, Bengaluru.
22. Dr. Suresh Kumar, Scientist – E, Wildlife Institute of India, Dehradun.
23. Mr. Anirudhkumar Vasava, Research Coordinator, Voluntary Nature Conservancy, Vallabh Vidyanagar, Gujarat.
24. Mr. Dhaval Vargiya, Program Officer, Bharati Vidyapeeth Institute of Environment Education and Research, Pune.
25. Ms. Pratiksha Kothule, Wildlife Biologist, Nature Conservation Society of Nashik.
26. Dr. Meghana Natesh, Post-Doctoral Research Fellow, IISER Tirupati.
27. Ms. Pooja Kothule, Field Officer, Nature conservation society of Nashik.
28. Mr. Kiran Srivastava, Raptor Research and Conservation Foundation, Mumbai.
29. Mr. Girish Punjabi, Conservation Biologist, Wildlife Conservation Trust, Mumbai.

30. Ms. Pooja Choksi, PhD Candidate, Columbia University, New York.
31. Ms. Rinkita Gurav, Manager - Raptor Conservation, WWF India.
32. Mr. Rohidas Dagale, Owl Conservation Foundation, Mumbai.
33. Mr. Sandeep Chouksey, Project Officer, WWF-India.
34. Dr. Babu Santhanakrishnan, Senior Scientist, SACON, Coimbatore.
35. Dr. Aditi Mukherjee, Scientist, SACON, Coimbatore.
36. Ms. Aditi Neema, Junior Research Biologist, SACON, Coimbatore.
37. Mr. Kaushik Koli, Junior Research Biologist, SACON, Coimbatore.
38. Mr. Vinay K. L. Junior Research Biologist, SACON, Coimbatore.
39. Mr. Paul Antony B., Junior Research Biologist, SACON, Coimbatore.
40. Ms. Zainab Khan, Junior Research Biologist, SACON, Coimbatore.
41. Mr. Viral Joshi, Project Associate, IISER-Tirupati.
42. Ms. Amrutha Rajan, Project Student, IISER-Tirupati.
43. Dr. Sushma HS, Adjunct Scientist, SACON, Coimbatore.
44. Dr. Robin Vijayan, Assistant Professor, IISER Tirupati.
45. Dr. Rajah Jayapal, Senior Principal Scientist, SACON, Coimbatore.
46. Dr. Shomita Mukherjee, Senior Principal Scientist, SACON.

Appendix-V: List of participants in thematic groups

Research Group

1. Dr. Sushma HS, Adjunct Scientist, SACON, Coimbatore. ***Coordinator***
2. Dr. Robin Vijayan, Assistant Professor, IISER Tirupati. ***Coordinator***
3. Dr. Prachi Mehta, Senior Scientist and Executive Director, Wildlife Research and Conservation Society, Pune.
4. Dr. Girish Jathar, Assistant Director, Bombay Natural History Society, Mumbai.
5. Mr. Dharmaraj Patil, Head, Environment Program, Raintree Foundation.
6. Mr. Jenis Patel, PhD student, Nature Conservation Foundation, Mysuru.
7. Mr. Kaushal Patel, Research Associate, Wildlife Conservation Society-India.
8. Dr. Babu Santhanakrishnan, Senior Scientist, SACON, Coimbatore.
9. Mr. Viral Joshi, Project Associate, IISER-Tirupati.
10. Mr. Vinay K. L. Junior Research Biologist, SACON, Coimbatore.
11. Ms. Zainab Khan, Junior Research Biologist, SACON, Coimbatore.

Policy Group

1. Dr. Rajah Jayapal, Senior Principal Scientist, SACON, Coimbatore. ***Coordinator***
2. Dr. K. Sankar, Director, SACON.
3. Dr. Himmat Singh Negi, Additional Principal Chief Conservator of Forests, Madhya Pradesh Forest Department.
4. Mr. L. Krishna Moorthy, Chief Conservator of Forests & Field Director, Satpura TR, Madhya Pradesh, Forest Department.
5. CCF Khandwa, Madhya Pradesh Forest Department
6. Mr. Uday Vora, Chief Conservator of Forests (Retd.), Gujarat Forest Department.
7. Mr. Anil Anjankar, Conservator of Forests (Wildlife), Nashik, Maharashtra Forest Department.
8. Ms. Piyusha Jagtap, Deputy Conservator of Forests, Amravati, Maharashtra Forest Department.
9. Mr. Gaurav Chaudhary, Deputy Conservator of Forests, Burhanpur, Madhya Pradesh Forest Department.
10. Mr. Bhanudas Pingale, Deputy Conservator of Forests (Wildlife), Thane, Maharashtra Forest Department.
11. Mr. Bharat Shinde, Assistant Conservator of Forests (Wildlife), Nashik, Maharashtra Forest Department.

12. Ms. Madhumitha S., Assistant Conservator of Forests, Melghat TR, Maharashtra.
13. Mr. Kamlesh Patil, Assistant Conservator of Forests, Maharashtra Forest Department.
14. Dr. Prachi Mehta, Senior Scientist and Executive Director, Wildlife Research and Conservation Society, Pune.
15. Mr. Dharmaraj Patil, Head, Environment Program, Raintree Foundation.
16. Mr. Girish Punjabi, Conservation Biologist, Wildlife Conservation Trust, Mumbai.
17. Mr. Dhaval Vargiya, Program Officer, Bharati Vidyapeeth Institute of Environment Education and Research, Pune.
18. Mr. Anirudhkumar Vasava, Research Coordinator, Voluntary Nature Conservancy, Vallabh Vidyanagar, Gujarat.
19. Mr. Kaushik Koli, Junior Research Biologist, SACON, Coimbatore.
20. Ms. Aditi Neema, Junior Research Biologist, SACON, Coimbatore.

Outreach Group

1. Dr. Pankaj Koparde, Assistant Professor, MIT World Peace University, Pune. ***Coordinator***
2. Dr. Pranav Trivedi, Consultant Nature Educator & Ecologist, Navsari, Gujarat.
3. Ms. Pooja Kothule, Field Officer, Nature conservation society of Nashik.
4. Ms. Rinkita Gurav, Manager - Raptor Conservation, WWF India.
5. Mr. Sandeep Chouksey, Project Officer, WWF-India.
6. Ms. Madhumita S. Assistant Conservator of Forests, Melghat TR, Maharashtra.
7. Dr. Meghana Natesh, Post-Doctoral Research Fellow, IISER Tirupati.
8. Mr. Paul Antony, Junior Research Biologist, SACON, Coimbatore.
9. Ms. Amrutha Rajan, Project Student, IISER-Tirupati.