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Java Sparrow: A Post-Release Study for the Friends of the National Parks Foundation's Bird Sanctuary

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Summary

The aim of this study is to evaluate the success and effectiveness of the Friends of the National Parks Foundation's rehabilitation and release programme of the vulnerable Java Sparrow on the island of Nusa Penida, Indonesia. Post-release monitoring was conducted, recording population numbers, behavior and habitat preferences within two distinct locations around the Ped region of Nusa Penida. A total of 38 observations were conducted over a period of 10 days. Results showed the Java Sparrow population wasn't consistently or frequently spotted within the study area and further monitoring and research is required to identify nesting and roosting sites on the island. Improvements to the monitoring process were identified and recommendations for repeated post-release study were discussed.

Introduction

Friends of National Parks Foundation (FNPF) is a non-profit organisation working to preserve Indonesia's wildlife and its habitat. FNPF have developed a unique programme which combines land restoration, animal conservation (release and protection), ecotourism, conservation education and community development with an aim to create lasting benefits for both wildlife and humans. The objective of this study is to assess FNPF's work on Nusa Penida to develop a bird sanctuary, providing habitat and protection for the critically endangered Bali Starling (*Leucopsar rothschildi*) and the threatened Black Winged Starling, Mitchell's Lorikeet, the Lesser Yellow Crested Cockatoo and Java Sparrow (*Padda oryzivora*).

Specifically this study aimed to continue the monitoring of the rehabilitation and release programme of the Java Sparrow. Through the post release study of the Java Sparrow - investigating various aspects of Java Sparrow population that were released on Nusa Penida to assess the population size, survival rates, habitat use and ecology of the Java Sparrow – the study aims to monitor the success of FNPF's Java Sparrow rehabilitation programme and to inform future rehabilitation and release initiatives in the recovery of this vulnerable species.

This study will highlight the importance of conducting post-release reviews/studies for determining post-release survival, dispersal, reproductive success, and behaviour of rehabilitated wildlife. Such studies offer an opportunity to evaluate and compare the successfulness of varying approaches utilised in modern rehabilitation practices – specifically looking at the unique approach FNPF takes to rehabilitation and the advantages of this against other approaches. Wildlife rehabilitation is a young science and frequently is criticised for its lack of quantitative evidence describing survivorship, behavioural responses, and overall reproductive fitness of rehabilitated wildlife following release – it is hoped this study will provide an opportunity to contribute to this evidence.

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Finally, this report will provide evidence to support the work of FNPF - specifically the success and continuation of their Nusa Penida programme - and their involvement in protecting this vulnerable bird species, as well as the critically endangered Bali Starling, their community development activity and work with the environment. It is hoped that the success of FNPF's unique approach to conservation will help to inform future rehabilitation and release initiatives.

Java Sparrow

The Java Sparrow, *Padda oryzivora*, is a small [passerine bird](#). This [estrildid finch](#) is thought to be endemic to [Java](#), [Bali](#) and [Bawean](#) in [Indonesia](#) - although it is a popular cage bird and has been introduced in a large number of other countries.

The Java Sparrow is a decorative bird of around 17 cm in length when mature. The adult is unmistakable, with its grey upperparts and breast, pink belly, white-cheeked black head, red eye-ring, pink feet and thick red bill. Both sexes are similar and identification can be difficult. Immature birds have brown upperparts, pale brown underparts, and a plain head.

The Java Sparrow is usually a lowland species, predominantly found below 500 m but occurring locally up to 1,500 m. It has been recorded in many habitats including towns and villages, cultivated land, grassland, open woodland, tree savanna, beach forest and even mangroves.

It is gregarious by nature, especially outside the breeding season, and can often be seen as part of large flocks - particularly in paddy fields where they are seen as vermin due to their ability to devour rice crops.

This distinctive bird was once prolific throughout Bali and Java and many of the Indonesian territories, but numbers have crashed disastrously - the trapping of the wild Java Sparrows has had a significant effect on the wild

population. Due to its attractiveness and popularity as a caged bird, it is now considered vulnerable and has been listed on CITES Appendix II (Kurniandaru, 2008). Hunting for local consumption, and possibly increased use of pesticides and competition with the ecologically similar Tree Sparrow *Passer montanus*, are additional threats (Birdlife International, 2012).

The most recent undertaken survey of the Java Sparrow looked at 64 former locations and located only 109 individuals at 17 sites (Mughtar and Nurwatha, 2001). It is thought that there are now less than 10,000 mature Java Sparrows in the wilds of Indonesia (Birdlife International, 2001). “Diversity of life and living systems are a necessary condition for human development” (Ishwaran & Erdelen, 2006, p. 179). It is considered a necessity to protect the decline of species such as the Java Sparrow because of the impact it would have on the diversity of bird species, and on ecosystems - passerine birds play an important role in the dispersal of seeds in forest/woodland ecosystems (Wunderley, 1997; Whelan, Wenny, Marquis, 2008). It is also important to protect the decline of species so that future generations can appreciate and enjoy the beauty and life that they bring.

What is the best method for protecting and re-establishing wild populations of these vulnerable/endangered birds – previously there have been numerous approaches suggested with varying levels of success (Cade & Seddon, 1998). Prevention of poaching/caging, education of local residents, introduction of formal policies and new laws, and dedicated sanctuaries have all been identified as valuable protection methods however have rarely been utilised together in a complete and comprehensive programme (Sodhi & Smith, 2007). FNPF have developed a unique holistic method combining different approaches and put it into action on Nusa Penida with their Bird Rehabilitation Programme. FNPF has already seen successes with this particular approach for the rehabilitation of the endangered Bali Starling.

Research Location

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Nusa Penida is an [island](#) southeast of [Bali, Indonesia](#). Administratively, the island is a [district](#) of [Klungkung](#) regency along with the two smaller islands of [Nusa Lembongan](#) and [Nusa Ceningan](#).. This group of islands has a diverse range of habitats from ocean, and coastal beaches to mangrove forests, dry farming land and small pockets of forest. The interior of Nusa Penida is hilly with a maximum altitude of 524 metres. Unlike the neighbouring islands there is very little tourist infrastructure.

The study area was confined to the Ped, Prapat and Toyapakeh regions of the island.

Nusa Penida Bird Rehabilitation Programme

One very unique aspect of Nusa Penida is that it acts as an island-wide bird sanctuary – unique in that the island's communities have used traditional Balinese village regulations to create a safe haven for endangered and vulnerable Indonesian bird species. This is one aspect of the bird rehabilitation programme run by FNPF that has helped enable success in establishing bird populations on the island (e.g. Bali Starling). FNPF have worked to create a place where endangered birds could be released to rebuild their numbers, free from the threat of poachers – over a 2 year period FNPF consulted with the influential people on Nusa Penida on the benefits of protecting birds and conservation. This resulted in a unanimous, island-wide agreement (all 41 villages) to make bird protection part of their traditional regulations (“awig-awig”) - making it a social and spiritual obligation for all residents to protect birds. Since then, FNPF has rehabilitated and released various Indonesian birds, most notably the critically endangered [Bali Starling](#) which is endemic to Bali but whose numbers in the wild had declined to less than 10 in 2005. After a 2 year program by FNPF in which 64 cage bred birds were rehabilitated and released onto Nusa Penida, their number had increased to over 100 in 2009.

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In return for this unanimous commitment by all villages to protect birds, FNPf runs a variety of community wellbeing / development projects. FNPf sponsors children to attend school and university; runs a community library; funds traditional dance classes; teaches sustainable farming; grows and freely distributes tree saplings for villages to build future incomes from agro-forestry; plants trees on degraded land to restore forests. Education and economic improvements that are in harmony with the environment enable the local communities to improve their wellbeing and participate in conservation. Trees reduce soil erosion, increase rainfall and provide economic benefit to residents and more importantly a perfect habitat for birds.

The focus then turned to the vulnerable Java Sparrow and in July 2011, on the fifth anniversary of FNPf, they released 100 [Java Sparrows](#). The birds were released in a large flock because this reduces the chances of predation. The 100 Java Sparrows were reared in Ubud, Bali. The young birds were rescued from Bali's Denpasar bird market and reared in a garden aviary for almost 1 year. They were then relocated to FNPf's centre on Nusa Penida where they were rehabilitated for 3 months before being released through a traditional Balinese temple ceremony.

In summary, this bird rehabilitation programme sees the establishment of a protected environment for the birds, it involves policies and traditional laws to encourage the community to take part in conservation and bird protection, as well as reforestation to ensure there are no threats from deforestation and a good source of food for the birds. Following the release of the Java Sparrow flock, it is now important to understand if this bird species has benefitted from this unique rehabilitation programme.

Method

This paper is based on work conducted between 20th November 2011 and 7th December 2011 under the direction of FNPf's Bird Conservation Programme and the support of its staff on Nusa Penida and Bali. The method used was

appropriate to the location of the bird observation. A total of 2 sites were identified for the monitoring of the Java Sparrow. These were sites pre-identified by FPNF staff who had been conducting bird monitoring around the island since the project began. As well as these two pre-identified sites, throughout the period of data collection, other potential sites were identified and visited in the hope bird monitoring could be conducted there also – these potential sites were based on the knowledge of the staff, as well as the local people's knowledge of where birds had been spotted, and focused on possible roosting/nesting locations. The sites varied from a highly trafficked temple location, to a high elevation abandoned temple and woodland. Additional sites searched varied from roadsides to outside homes and villages, beaches, farmland and forests at varying elevations.

Distance between sites was also taken into consideration - the two sites were located a significant distance from each other so there was minimal chance for one bird to be counted twice by travelling from one site to the next in the time it took for the observer/s to travel between sites. In addition, the sites were located close enough to each other so that the observers could easily travel between sites, by motorbike, within the time frame placed for bird observation.

A total of 38 observations were made at the two identified sites, and 8 additional areas were identified and searched, over a period of 10 days. Surveys were carried out between 0530hrs and 1000hrs, and 1530hrs and 1800hrs, the peak times for bird activity. No observations were carried out in adverse weather conditions of rain, low cloud, or strong wind due to the effects these conditions have on bird activity (Howe, Niemi, Lewis & Welsh, 1997; Riley, 2003). The sites were monitored up to a total of 30 minutes. Once one site was completed, the observer would move directly to the next site to begin bird observation.

When an observation was conducted, time of arrival at site was noted. The observer would then begin to scan the site for evidence of birds – both binoculars and the naked eye were used for bird spotting. As both sites

covered an area the size of a large temple, the observer would begin to slowly move throughout the site to help increase chances of spotting. As soon as a bird was spotted, the time of spotting would be recorded, as well as the number of birds (as they could be spotted in pairs or flocks). If subsequent birds were spotted, additional time recordings and counts would be made. In addition, the observer would record the behavior of the birds (comments on nest-making, food foraging, interaction with other birds etc), as well as brief notes on the weather conditions, habitat and any other significant conditions affecting the site. If birds were spotted, the GPS coordinates were also recorded to determine the bird's exact location. If no birds were spotted within 30 minutes of searching the site, observation at the site would be terminated.

Results

It is evident from the results tables (see Appendix 1) recording the overall bird counts at each site over the 10 day monitoring period that the Java Sparrows were not spotted at either of the observation sites consistently or frequently during the 12 day period. Java Sparrows were only observed at one of the sites, and only for a 2 day period. It cannot be determined the reason for this activity. In total, there were 11 bird sightings, but this does not mean 11 individual birds. The mean number of birds observed in one bird observation period was 2.75 birds, and this was just at site A.

The birds that were observed at the Ped Temple location used Frangipane trees for cover and to rest, and fed on the rice used at the temple as an offering by those people visiting for prayers. It was surprising not to see them in a larger flock. The Java Sparrows also fed with other small passerine birds that nest at the temple.

Additional locations in the Prapat, Ped and Toyapakeh regions of the island that were searched for the Java Sparrow did not identify further bird observation sites.

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Certain methodological factors that were beyond the control of the researcher may have influenced the results and are worth noting here. Observations were only carried out by one researcher – although there was significant support from the FNPF staff, there were only certain occasions that there would be additional observers available to conduct the site visits. Obviously the more observers present, the more likely it would be to spot birds. In addition, the experience of the observer to identify and spot birds would have affected the results collected. As the observer was not an experienced in bird monitoring, there was a possibility they would be unable to identify birds by sight/sound (Hipperson, 2010).

Also, only two sites were monitored where there were previous bird sightings and there was an inability by the observer to correctly identify further bird sites, thus potentially producing skewed results – birds may have been visiting other sites not identified. Because of this small range of areas monitored, it would be unrealistic to generalise results to a conclusive bird count and make assumptions about the state of the overall bird population on the island.

The final thing to note is the possibility of the same bird being counted numerous times. Although steps were taken to minimise the chance of this occurring, it is important to note that it could still have occurred.

Discussion

The purpose of this study was to determine if the released Java Sparrows had established or looked to be in the process of establishing a stable population after release. These results suggest that the birds' permanent habitats and/or nesting sites were not identified and so further observations need to be carried out in other sites across the island to establish the exact nesting and roosting sites of the Java Sparrow.

It makes it difficult to determine the fate of the released birds due to the spotting of some birds, which then appeared to disappear completely from the

area. No deceased birds were identified, and no predators were observed, which may have been a probable cause for the non-identification of the birds. It should be noted that observations were restricted to three small regions of Nusa Penida Island and so no conclusions can be reached about the overall outcome of the Java Sparrows' fate – as noted in the results birds may have been visiting other part of the island, which were not identified.

The birds that used the Ped Temple site may have been affected by the intense period of religious celebrations that were taking place during the study period. The temple was in heavy use, with constant noise and people visiting. This may have deterred the birds from establishing themselves at the site, and so they moved on. The site could also have been a temporary stop on their way to their actual nesting site.

It should also be noted that the Java Sparrows would have needed to adapt to the climate - the landscape of Nusa Penida is surprisingly different from Bali, where Java Sparrows used to be in abundance. Nusa Penida is quiet, hot and arid. There is no wet rice cultivation on Nusa Penida and the main farming industry is seaweed cultivation. The biggest concern I think would therefore be finding abundant food supplies if their main diet previously has been rice fields. A previous study has noted that post-breeding Java Sparrow flocks appear to make substantial short-distance movements in response to local food supplies ([Birdlife](#) International, 2012). Therefore it might be possible that the Java Sparrows have moved a significant distance away from the monitoring sites investigated in this study, to other part of the island.

It is clear that further research is required to determine the status of the released Java Sparrows on Nusa Penida. It is in fact crucial to continue regular monitoring in order to identify where the birds and nesting and roosting. This requires a concerted effort by the staff and volunteers at FNPF's Nusa Penida Sanctuary throughout the next year and beyond. Some recommendations to ensure further monitoring continues in a reliable and consistent way:

- More consistent monitoring needed by dedicated staff members e.g. daily searching of sites. Potential sites across the island need to be identified and then methodically searched one by one
- Microchipping and tagging would aid monitoring – it has been shown in monitoring studies that microchipping and tagging of the birds greatly aids future bird spotting and identification (Black, 1991; Seddon & Cade, 1998). Not only will it enable researchers to identify the birds roosting/nesting sites, but it will help to identify age, sex, date of release etc
- Involving local community in reporting bird sightings – FNPF already rely on the villages of Nusa Penida to actively maintain a secure environment for the birds, and it would not take much to recruit those living on the island to report any sightings of the Java Sparrow.
- It would be helpful to set up a bird monitoring and reporting system – this was done previously at FNPF for the Bali Starling and I would highly recommend this continues for the Java Sparrow. To accompany this, sightings should be plotted on a map, to help understand the areas the birds travel through, live in etc. It can also then be used to mark off areas searched. This will enable all staff/researchers to know what has been searched/what hasn't been searched so any new persons to the project can easily pick up what is left to do
- A standardized monitoring protocol should be determined and used to conduct all bird monitoring for FNPF – being repeatable means that results will be comparable and reliable and provide overall reporting of long term population trends (Hipperson, 2010)

It has previously been noted that wildlife conservation programmes need to be conducted as an integral component of the wider ecological and socio-economic efforts in ecosystem protection and restoration (Black, 1991). FNPF certainly do this, and it is clear that through their work they have

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developed a successful rehabilitation and release programme, evident through the flourishing Bali Starling population. However it is also clear that further work is needed to continue monitoring of those released species, to assess the release programme. By doing so, the programme can be adapted and continually updated to ensure the best success for the birds. In addition, by assessing the programme regularly and documenting it, it will aid the development of successful approaches to wildlife conservation/rehabilitation (Amory, 2008; Black, 1991).

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Appendix 1: Tables of Results

*Please note, GPS Coordinates were only recorded when birds were observed

Date - 20 November 2011

Site Label	GPS Coordinates	Arrival Time at Site	Spotting Time of Bird	Bird Count	Comments
A	-	8am	-	0	No evidence found for Java Sparrow
B	-	8.41am	-	0	No evidence found for Java Sparrow
A	-	4.10pm	-	0	
B	-	4.45pm	-	0	

Date - 21 November 2011

Site Label	GPS Coordinates	Arrival Time at Site	Spotting Time of Bird	Bird Count	Comments
A	-	7.15am	-	0	
B	-	7.50am	-	0	
A	-	4.45pm	-	0	
B	-	5.20pm	-	0	

Date - 22 November 2011

Site Label	GPS Coordinates	Arrival Time at Site	Spotting Time of Bird	Bird Count	Comments
A	-	6.30am	-	0	
B	-	7.05am	-	0	
A	-	5pm	-	0	
B	-	5.36pm	-	0	

Date - 23 November 2011

Site Label	GPS Coordinates	Arrival Time at Site	Spotting Time of Bird	Bird Count	Comments
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A	-	7am	-	0	
B	-	7.35am	-	0	
A	-	4.30pm	-	0	
B	-	5.20pm	-	0	

Date - 24 November 2011

Site Label	GPS Coordinates	Arrival Time at Site	Spotting Time of Bird	Bird Count	Comments
A	-	6.10am	-	0	
B	-	6.45am	-	0	
A	S 08 ⁰ 40' 41.2 E 115 ⁰ 31' 07.0 Elevation 7m	4pm	4.20pm	3	Two birds roosting in frangipane tree, one bird roosting in neighbouring tree
B	-	4.40pm	-	0	No evidence found for Java Sparrow

Date - 25 November 2011

Site Label	GPS Coordinates	Arrival Time at Site	Spotting Time of Bird	Bird Count	Comments
A	S 08 ⁰ 40' 41.2 E 115 ⁰ 31' 07.0 Elevation 7m	8.08am	8.32am	2	Birds foraging on floor of temple and resting in frangipane tree. No apparent nests or nesting behaviour.
B	-	8.43am	-	0	
A	S 08 ⁰ 40' 41.2 E 115 ⁰ 31' 07.0 Elevation 7m	4.26pm	4.40pm	5	Foraging on temple gifts - rice and leftover food. Using frangipane tree as shelter. Eating with other type of small pesserine bird, possibly sparrow
B	-	4.56pm	-	0	

Date - 26 November 2011

Site Label	GPS Coordinates	Arrival Time at Site	Spotting Time of Bird	Bird Count	Comments
A	S 08 ⁰ 40' 41.2 E 115 ⁰ 31' 07.0	5.59am	6.15am	1	Appears to be foraging on leaves at the very top of tree

	Elevation 7m				
B	-	6.32am	-	0	
A	-	3.40pm	-	0	Temple very busy with people and bell ringing which may have affected the birds
B	-	3pm	-	0	

Date - 27 November 2011

No morning session conducted due to special event happening at FNPf

Site Label	GPS Coordinates	Arrival Time at Site	Spotting Time of Bird	Bird Count	Comments
A	-	5pm	-	0	Temple had been busy throughout the day with ceremonies which may have affected the birds
B	-	5.38pm	-	0	

Date - 28 November 2011

Site Label	GPS Coordinates	Arrival Time at Site	Spotting Time of Bird	Bird Count	Comments
A	-	9am	-	0	Ceremony occurring throughout the temple - many people and lots of noise
B	-	9.37am	-	0	
A	-	4.11pm	4.20pm	0	
B	-	4.45pm	-	0	Spotted one Bali Starling on roof of temple

Date - 29 and 30 November 2011

No observations conducted due to illness of observer

Date - 1 December 2011

Site Label	GPS Coordinates	Arrival Time at Site	Spotting Time of Bird	Bird Count	Comments
A	-	7.20am		0	Several other bird species dominating the area around site. Perhaps competition has forced the Sparrows to move on elsewhere?
B	-	8am		0	Two Bali Starlings spotted near nest box put up recently for Java Sparrows
A	-	5.05pm		0	
B	-	5.42pm		0	

Additional sites search for evidence of Java Sparrow

Also checked new area surrounding temple further east of site A. No sightings
Also checked new area surrounding grazing fields south of site B. No sightings
Checked new area to the west of site A along sea front, no sightings
Checked new area leading from site A to site B, no sightings.
Checked new area to the west of site A - Blabuh, Dalem Bungkut Temple, Tanah Bias, Banjar Nyuh