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How Measure Biodiversity and Prioritize Conservation Areas

**Introduction**

Sri Lanka is home to many unique bird species and five southern national parks want to put in place a long-term conservation to protect the Sri Lankan birds. The five southern national parks in Si Lanka are site 1 with Yala National Park, park 2 is Uda Walawa national park, site 3 is Bundala national park, site 4 is Horton Plains national park, and site 5 is Gal Oya national park (Lab 7 handout). Local experts in Sri Lanka want site 1 chosen for the long-term conservation project because it’s the largest of all southern national parks. On the other hand, a group of biologists suggest choosing site 5 because it is the most isolated and biodiverse southern national park. With these recommendations, some local conservation groups suggest conserving all of the southern national parks (Lab 7 handout). When choosing a site for the long-term conservation project, the decision is based on limited funding, species endemism, and overall biological diversity. To choose the right site for the long-term conservation project, the focus will be on 21 indicator species of birds in Sri Lanka to base overall biodiversity of each site (Lab 7 handout). The objective of this project is to use the scientific method and disciplinary knowledge to prioritize conservation areas in Sri Lanka (Lab 7 handout).

**Methods**

5 southern national parks in Sri Lanka were chosen and the number of total species and endemic species were observed at each site and recorded into a table. After recording the total number of species and endemic specie at each of the 5 sites, the Simpson’s D and Shannon-wiener H’ were calculated in excel using given formulas. The total number of species, number of endemic species, Simpson’s D, and Shannon-wiener H’ were ranked from high to low for each site with 5 being the highest and 1 being the lowest. Lastly the community similarity between sites was calculated using the given formula for community similarity. Bar graphs were then made for total number of species, number of endemic species, Simpson’s D, and Shannon-wiener H’ for all sites.

**Results**

Out all 5 southern national parks in Sri Lanka, site 1 is best recommended for the long-term conservation project. This is because it has the highest amount total species and good amount of endemic species (Figure 1 and 2). This site also has the highest overall biological diversity compared to the other 5 sites (Figure 4). Biological diversity is a very important concept when choosing a site to conserve because it adds variation to the community. Site 1 also has the lowest amount of dominance in the community, this means site 1 is very diverse and in need of conservation (Figure 3). According to table 1, site 1 has some community similarity with site 2 and 3, but no similarity with 4 and 5 (Table 1). Overall, site 1 has the highest biological diversity and is home to a good amount of endemic species, this makes this site the best suited for the long-term conservation project in Sri Lanka.

**Discussion**

Out of the 5 southern national parks in Sri Lanka, site 1 is best suited for the long-term conservation project. Site 1 is best suited for the long-term conservation project in Sri Lanka, because it has the highest biological diversity compared to the other 5 sites. This park is also home to some endemic species and has the most amount of species. Another important factor is that the species dominance at this site is very low compared to the other 5 sites. Site 3 has a very high species dominance and low biological diversity, which makes it an immediate no for the long-term conservation project in Sri Lanka. A limitation of this study would be basing the data purely off of observations. This makes it hard to know the true numbers in each park. I recommend that site 1 is conserved and by putting more research into the area and coming up with a management plan to protect the biological diversity of this park. There should be protection of the habitat and the bird’s resources should be protected. I also believe public outreach would be valuable in the conserving the unique bird species in this park. In the future I recommend expanding the protected area and having education programs put in place to educate the people of Sri Lanka on their unique bird species. Overall, site 1 is best suited for the long-term management project in Sri Lanka.

**Figures and Tables**

**Figure 1.** Number of total species for all 5 sites.

**Figure 2.** Number of endemic species at all 5 sites.

**Figure 3.** Simpson’s index of dominance (D) for all 5 sites.

**Figure 4.** Shannon- wiener index of species diversity for all 5 sites.

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| **Sites** | **Site 1** | **Site 2** | **Site 3** | **Site 4** | **Site 5** |
| **Site 1** | N/A | 0.333333 | 0.333333 | 0 | 0 |
| **Site 2** | 0.333333 | N/A | 1 | 0 | 0 |
| **Site 3** | 0.333333 | 1 | N/A | 0 | 0 |
| **Site 4** | 0 | 0 | 0 | N/A | 0 |
| **Site 5** | 0 | 0 | 0 | 0 | N/A |
| **average** | 0.166667 | 0.333333 | 0.333333 | 0 | 0 |

**Table 1.** The community similarity between all 5 sites.

**References**

Gibbs, J.P., M.J. Hunter, Jr. and E.J. Sterling. 2009. Problem-solving in Conservation Biology and Wildlife Management (2nd edition). Blackwell Publishing.

Krebs, C.J. 1999. Ecological Methodology (2nd edition). Addison-Wesley Educational Publishers, Inc.