

Solving the Mystery of MPA Performance

Social impacts of MPAs in the Bird's Head Seascape

Marine protected areas (MPAs) are an integral component of local, national, and international strategies for biodiversity conservation, but their impacts on human well-being remain contested. Advocates tout MPAs as win-win strategies for conservation and poverty alleviation, while skeptics argue that MPAs place the welfare of fish above the well-being of impoverished fishing communities. To inform this debate and support upcoming decisions about coastal zone management, World Wildlife Fund-US (WWF) is leading a collaborative effort to evaluate the social impact of MPAs in the Bird's Head Seascape of Papua, Indonesia.

We are documenting the magnitude of MPA impacts on local households, as well as variation in impacts across social domains and among social groups. In partnership with Universitas Negeri Papua (UNIPA), we are monitoring 15 human well-being indicators across five domains:

- Economic well-being
- Health
- Political empowerment
- Education
- Culture

To link intervention to impact, we also document patterns and trends in marine resource governance. We adopt best practice, monitoring changes in well-being and governance in both MPA communities and similar communities who live outside MPA boundaries.

From 2010 to 2012, the WWF-UNIPA team documented baseline social conditions in six MPAs in the Bird's Head Seascape (Fig. 1), building a globally unique dataset of social well-being and marine resource governance spanning more than 2,400 households in 102 settlements. In mid-2012, we began follow-up monitoring to identify the short-term social impacts of MPA establishment.

Baseline Insights

Communities in the Bird's Head Seascape are highly dependent on marine resources. Fishing is the primary occupation for 31% of surveyed households and a secondary or tertiary occupation for another 47% of households. Fishing is the main source of monetary income for many households (29%) and provides the majority of dietary protein for most households (75%).

Food security is relatively low for resource-dependent communities in the Bird's Head Seascape. Most households are 'food insecure', meaning that household members have concerns about the adequacy of food supplies. One household in eight (13%) experiences recurrent, involuntary hunger resulting from limited or uncertain access to acceptable foods. Food security varies across the Seascape, with considerable differences in household food security status among MPAs (Fig. 2). At baseline, food security is comparable in MPA households and their non-MPA neighbors.

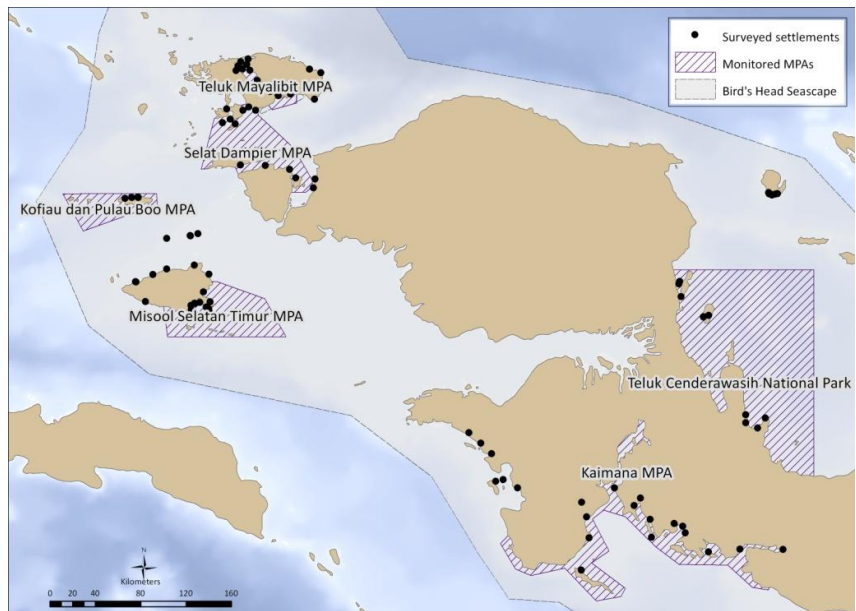


Figure 1. Settlements surveyed to document social impacts of six MPAs in the Bird's Head Seascape.

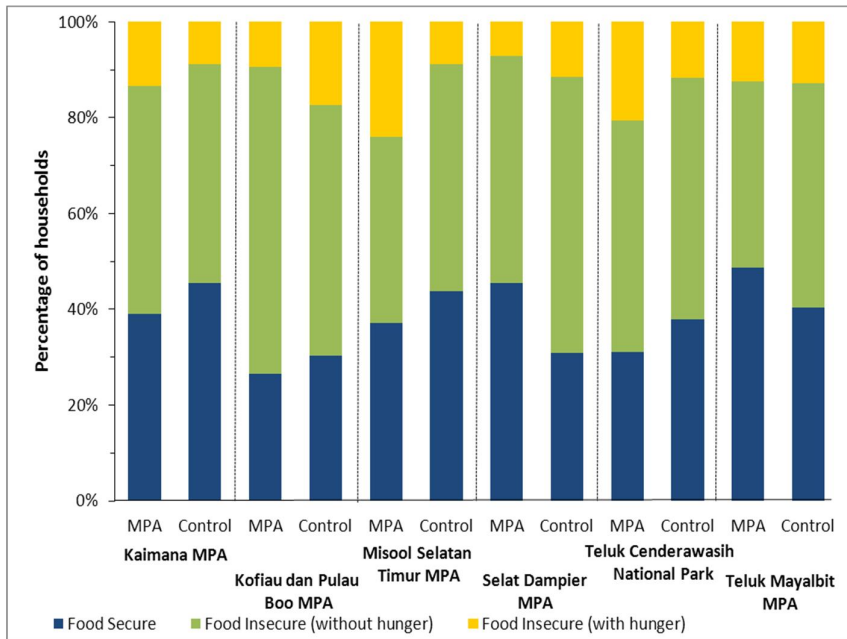


Figure 2. Food security status of MPA and non-MPA households in the Bird's Head Seascape

We document place attachment (the emotional bond between an individual and a particular place) as a novel, quantitative measure of the cultural impacts of MPAs. Bird's Head Seascape residents have strong emotional connections to the local marine environment (Fig. 3), regardless of their location or their proximity to an MPA.

Preliminary analyses suggest that fishers have significantly stronger place attachment than their non-fishing neighbours ($P < 0.01$). Households with high economic dependence on fishing exhibit greater place attachment than less dependent households ($P < 0.01$).

Implications for policy and practice

These preliminary insights provide decisionmakers in the Bird's Head Seascape with salient and credible information for adaptive management. These results also highlight the potential for well-designed monitoring to inform conservation policy and practice.

In the near term, insights on the short-term (baseline + 2 years) social impacts of MPAs establishment will inform planning and implementation in the Bird's Head Seascape (e.g., Walton Family Foundation Phase IV).

Continued long-term monitoring in the six MPAs (and their controls) will generate globally unique insights on the social impacts of MPA establishment, informing management of Bird's Head MPAs and shaping global MPA policy debates.

Social monitoring in the Bird's Head Seascape has become a model for the Coral Triangle and beyond. Well-designed social monitoring in a growing cohort of MPAs will enable us to document how marine resource governance shapes the impacts of MPAs on human well-being. By linking interventions to impacts, this approach will provide policymakers with evidence necessary to ensure that MPAs realize their full potential as a conservation strategy.

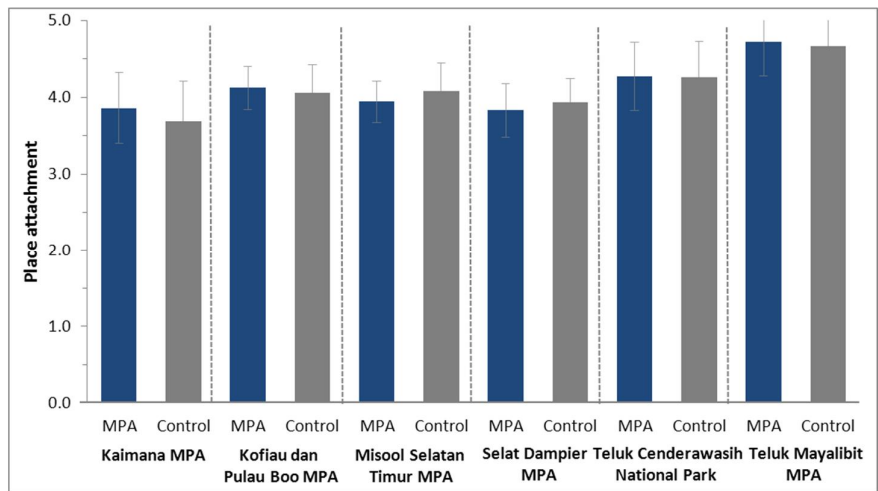


Figure 3. Place attachment of MPA and non-MPA household heads in the Bird's Head Seascape



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BIRD'S HEAD SEASCAPE

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Table 1. Human well-being indicators monitored in Bird's Head Seascape MPAs and controls.

Domain	Indicator
Economic well-being	Primary source of livelihood Household assets Cooking fuel
Health	Household food security Child food security Morbidity Mortality
Political empowerment	Resource rights Community organization Political engagement
Education	School enrollment School enrollment gender ratio Environmental knowledge and awareness
Culture	Social conflict Place attachment

Table 2. Sample sizes of baseline social monitoring efforts in six MPAs and non-MPA control sites in the Bird's Head Seascape. Household surveys document human well-being. Focus groups and key informant interviews document marine governance.

Site	Monitoring year	Surveyed settlements	Sample size		
			Household survey	Focus group	Key informants
Kaimana MPA	2012	21	485	10	20
Kofiau dan Pulau Boo MPA	2011	8	271	4	18
Misool Selatan Timur MPA	2011	19	369	5	14
Selat Dampier MPA	2012	17	483	7	12
Teluk Cenderawasih National Park	2010	23	468	12	22
Teluk Mayalibit MPA	2010	14	357	7	27
<i>Bird's Head Seascape Total</i>		<i>102</i>	<i>2433</i>	<i>45</i>	<i>113</i>