



Social reform and a growing crisis for southern Myanmar's unique forests

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Introduction

Authoritarian political regimes are unpredictable in terms of their impacts on biodiversity. They tend to have poorly developed and implemented environmental legislation, weak engagement in multilateral environmental agreements and often discourage non-governmental organizations (NGOs). However, the suppression of private enterprise, low gross domestic product, inefficient governance, and lack of access to markets and technology may slow the loss of pristine ecosystems in non-democratized countries. The environmental impacts of democratic transition are even harder to predict. The breakup of the Soviet Union after 1991 led initially to a collapse in state funding for protected areas but also to increases in the populations of many bird species and the proliferation of environmental NGOs (Wells & Williams 1998; Kamp et al. 2011). In Vietnam rapid post-socialist development brought huge financial benefits but greatly eroded the nation's biological resources while locking it into a reliance on energy-intensive production that renders it more vulnerable to climate change (Fortier & Tran 2013).

The widely welcomed process of democratization in Myanmar (Burma), which started with the 2010 general election and the dissolution of the military junta in 2011, was followed by an easing of economic sanctions and greater engagement in the global community. Social reform will bring many benefits but also carries substantial environmental risks (Webb et al. 2014). We assessed

recent environmental changes in southern Myanmar as political change increases commercial access to this previously restricted area.

Southern Myanmar's Unique Forests

The high rate of lowland forest loss across peninsular Thailand (Leimgruber et al. 2005), and elsewhere throughout the Sundaic zone (Lambert & Collar 2002), has thus far been prevented in Tanintharyi, Myanmar's southernmost region, by a volatile security situation linked to armed opposition to authoritarian rule. Tanintharyi now holds the largest remaining tracts of lowland wet evergreen forest in the biologically rich transition zone between the Indochinese and Sundaic regions. This confluence of biogeographic regions supports a unique assemblage of species, including the endemic and endangered Gurney's Pitta (*Pitta gurneyi*) and other globally threatened species, such as tigers (*Panthera tigris*) and Malayan tapirs (*Tapirus indicus*) (Hughes et al. 2003; Donald et al. 2014). These forests are therefore a rare survival in a biodiverse but otherwise heavily degraded region. Their lowland topography, one of the attributes that makes them so valuable for biodiversity, also renders them extremely vulnerable to logging, land speculation, hunting, and the expansion of agriculture and agroindustrial plantations. This vulnerability is exacerbated by their long border with mainly deforested and resource-hungry Thailand. The area is bioclimatically

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suitable for a range of crop types, such as oil palm and rubber, that have resulted in negative environmental impacts elsewhere (Fitzherbert et al. 2008; Phalan et al. 2013). A new national target for edible oil production has led to the allocation of large palm-oil concessions to favored businesses, with a target of nearly 3000 km² of oil-palm plantations by 2030 (Saxon & Sheppard 2014). Data collected by N.M.S. in January 2014 in the administrative region of Bokeyyin Township (Fig. 1) identified 12 oil-palm concessions totaling 550 km² granted to Burmese companies since the 2010 general election, and much of the area is within the proposed Lenya National Park. In the same region, 7 timber companies set a target to extract over 20,000 t of timber in 2014, much of it also inside Lenya (N.M.S., unpublished data). Mining interests are also moving into the area.

Rapid Forest Loss

We used satellite assessments of forest loss (Hansen et al. 2013) to assess the location and scale of forest loss in the region between 2000 and 2012. We considered any patch cleared during this period as unlikely to become reforested during the same period. Although mature plantations could not be distinguished from forest (Tropek et al. 2014), these data were produced with a standardized algorithm that allows comparison across time and are likely to be accurate in tracking rates of recent deforestation. Levels of loss estimated with this method compare well with more detailed assessments in Southeast Asia (Achard et al. 2014). Visual inspection of Landsat images taken before 2000 for evidence of mature plantations (characteristic reflectance, geometric edges, service roads, etc.) away from the coastal strip failed to identify any, so rates of deforestation recorded by Hansen et al. (2013) are likely to be an accurate measure of deforestation during this period.

There has been widespread and accelerating deforestation throughout southern Tanintharyi since 2000 (Figs. 1 & 2). The geometric patterns of plantations, most likely oil palm or rubber, are clearly visible in Landsat 8 images from March 2014 (Fig. 1, insets). These images also show that deforestation has accelerated rapidly in some areas since 2012. The linear band of deforestation to the north of the proposed Lenya National Park (Fig. 1, northern inset), an area unsuitable for oil palm production (Saxon & Sheppard 2014), follows a road leading eastward to the neighboring Thai province of Prachuap Khiri Khan and may suggest external drivers of encroachment. Illegal cross-border trade with Thailand in endangered species, particularly orchids, and other forest products is a persistent problem that will increase as border conflicts subside and new crossing points open. Figure 1 shows several incursions of deforestation from the Thai border into the proposed Lenya National Park.

Conserving Southern Myanmar's Forests in a Changing Political Climate

These forests and the many threatened species they support can yet be protected, given appropriate commitment by the government and participation of local communities. The country's National Biodiversity Strategy and Action Plan, a requirement of Myanmar's 1994 ratification of the Convention on Biological Diversity, identifies the conversion of southern forests to plantations as a threat and recognizes the proposed (in 2002) Lenya National Park (>3000 km²) (Fig. 1) as an important area for conservation (<https://www.cbd.int/doc/world/mm/mm-nbsap-01-en.pdf>). REDD+ may offer financial incentives for conserving Myanmar's Sundaic forests, and the Myanmar government recently produced a REDD+ Readiness Roadmap to guide implementation of the initiative in the country. There is also significant potential for environmental tourism as Myanmar opens up further, and in 2014 the government added the first natural sites to its UNESCO World Heritage Site tentative list.

Tanintharyi is most productive for oil palm in coastal areas south of the town of Myeik, and even there maximum yields are no more than half of what is achievable in equatorial areas of Malaysia and Indonesia, from where most of Myanmar's edible oil is currently imported (Saxon & Sheppard 2014). Despite the granting of oil-palm concessions that cover much of its area, there has as yet been little forest loss within the proposed Lenya National Park (Fig. 1), largely because of labor shortages, the marginal quality of the area for oil palm, the high incidence of malaria, and the continued presence of nonstate armed groups. The peace process may align ethnic and national conservation and development properties, and uncleared concessions may yet be renegotiated.

The engagement of international environmental NGOs (IENGOS) in developing countries has been effective in transferring global environmental values into national agendas, with measurable impacts on biodiversity (Shandra et al. 2009). Fauna & Flora International is working with the government and other stakeholders to identify high conservation values areas in the landscape and a range of suitable management options, including through community management and certified sustainable plantations. Meanwhile, the government remains committed to seeking formal protection for uncontested areas of forest and the cancellation of unused or otherwise unsuitable agroindustrial concessions. In late 2014, some of the oil-palm concessions granted over large areas of the proposed Lenya National Park were revoked, raising hopes that the region will be protected. Other IENGOS engaged in Myanmar, including World Wide Fund for Nature, Wildlife Conservation Society, and BirdLife International, are working on sustainable development, establishment of protected areas, and research on threatened species.

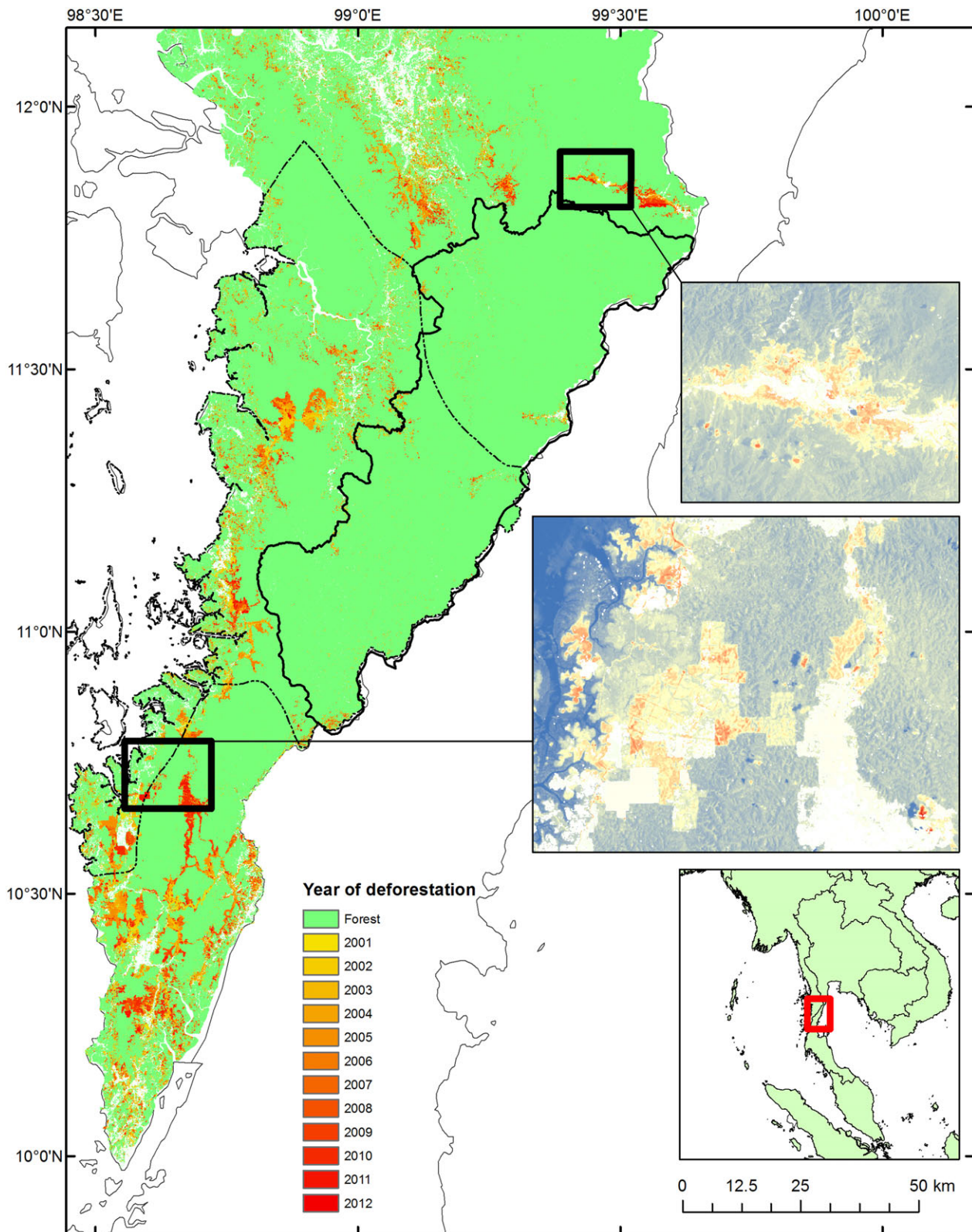


Figure 1. Deforestation from 2000 to 2012 (Hansen et al. 2013) in southern Tanintharyi, Myanmar (solid line, approximate [unformalized] boundary of the proposed Lenya National Park; dashed line, boundary of Bokepyin Township administrative region). Thailand is unshaded. Two insets show false color Landsat 8 images from March 2014 (white, areas indicated on the main map as being deforested from 2000 to 2012; yellow or red, deforestation after 2012).

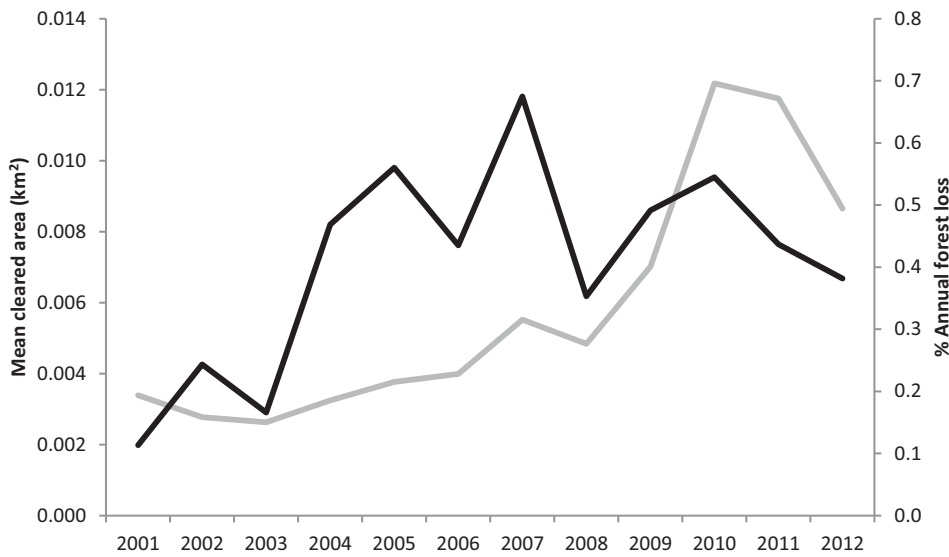


Figure 2. Changes in the mean area of individual deforested patches (gray line, mean cleared area) and percent annual loss of overall forest cover (black line) in Tanintharyi, Myanmar, from 2001 to 2012.

The time is right not only for investing in the people of Myanmar, but also for investing in the country's natural heritage and globally important biodiversity (BirdLife International 2003). In the short term, formal protection of the proposed Lenya National Park and greater engagement among all stakeholders to manage these forests for local livelihoods and biodiversity conservation would make a huge contribution to securing the country's natural wealth for future generations. Successful long-term conservation of the country's resources will require a substantial overhaul of Myanmar's environmental regulatory framework (Webb et al. 2012). This will be aided by stronger presence in the country of IENGOS. It is not too late to develop in Myanmar a model for guiding nascent democracies through the difficult transition process to full global integration while minimizing the environmental costs along the way.

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