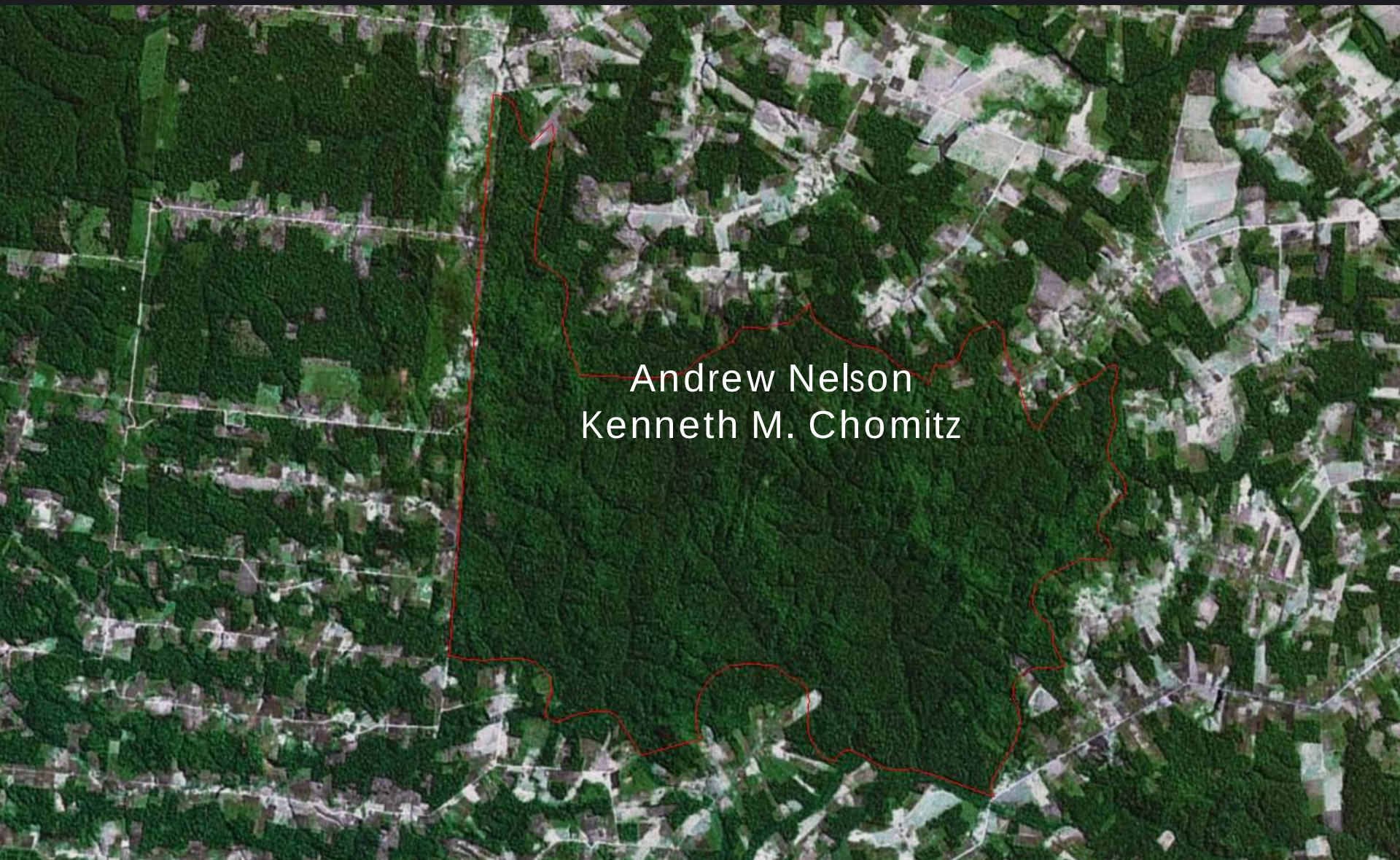
Do protected areas reduce deforestation?

A global assessment with implications for REDD

IEG
Independent Evaluation Group



Andrew Nelson
Kenneth M. Chomitz

The REDD challenge: what can be done?

- What is known about *how* to reduce deforestation?
- How can we rapidly and reliably learn what works and what doesn't?

Protected Areas (PAs) – a REDD analog

PAs are often intended to reduce deforestation – motivated by biodiversity conservation

Most REDD interventions will involve restrictions on allowable forest uses – so legal, economic, and enforcement issues are similar to PAs.

PAs have absorbed lots of effort, money, real estate…

But do they actually reduce deforestation?

Protected areas occupy a large and growing portion of Earth

1.4M sqkm, 20%

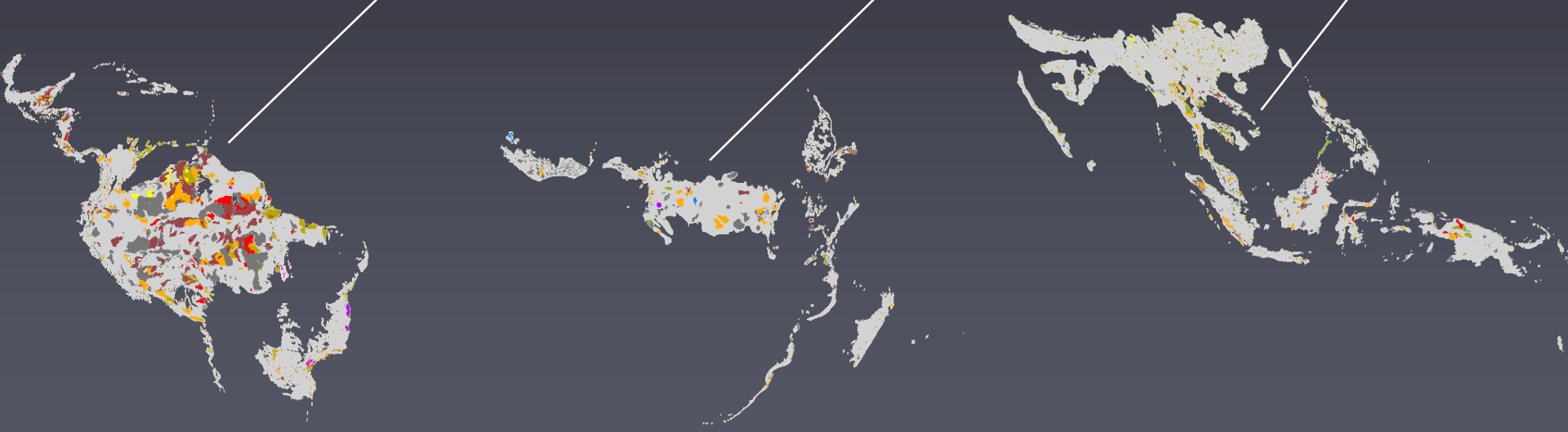
2.8M sqkm, 39%

0.2M sqkm, 9%

0.4M sqkm, 16%

0.3M sqkm, 9%

0.5M sqkm, 13%



15% of the tropical forest was “protected” in year 2000

This has expanded to over 27% in 2008

UNEP, IUCN (2009) World Database on Protected Areas (WDPA) Annual Release 2009

Land under indigenous control: 2000 and 2008

0.36M km^2, 5.1%

0.85M km^2, 12%

(Based on IUCN classification– data only for Latin America)

UNEP, IUCN (2009) World Database on Protected Areas (WDPA) Annual Release 2009

Large economic investments in PAs

- GEF 1991-2009 reports:
  - $1.6 billion direct investments
  - $4.2 billion cofinancing

  (much is via World Bank)
- Potentially large opportunity costs

PAs: Paper parks, conservation cornerstone, or exclusionary scheme?

Three stylized views:

- PAs effectively conserve forests; nothing else works as well

vs

- Underfunded PAs are unable to defend against depredation, and so are ‘paper parks’

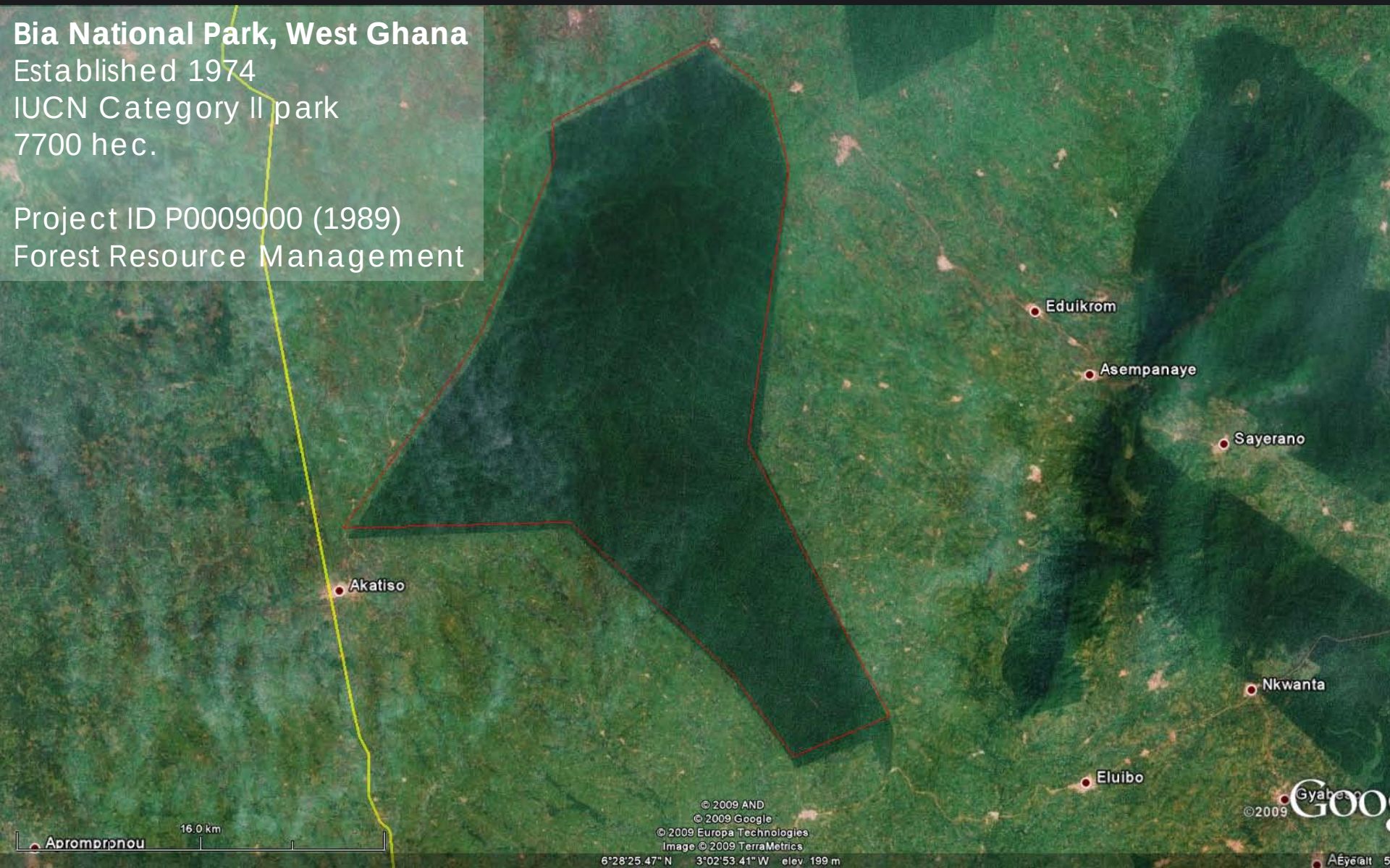
vs

- PAs defend *too* well, excluding poor and local people

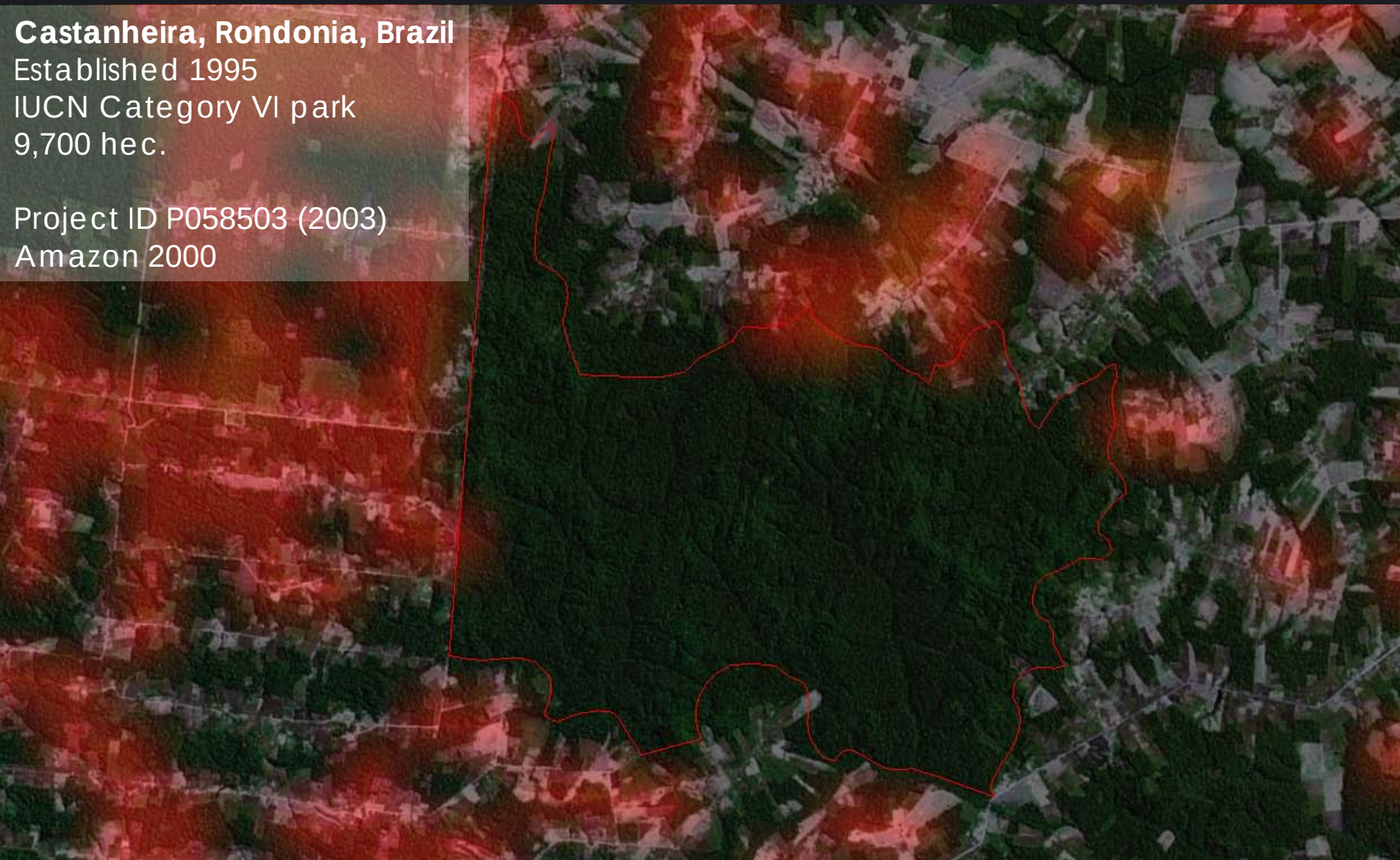
Controversy persists due to lack of evaluation

- Few rigorous evaluations of environmental impacts
- Almost none of social impacts
- Reasons for lack of evaluation
  - Naïve evaluations are misleading; must account for confounding influences
  - Dearth of data

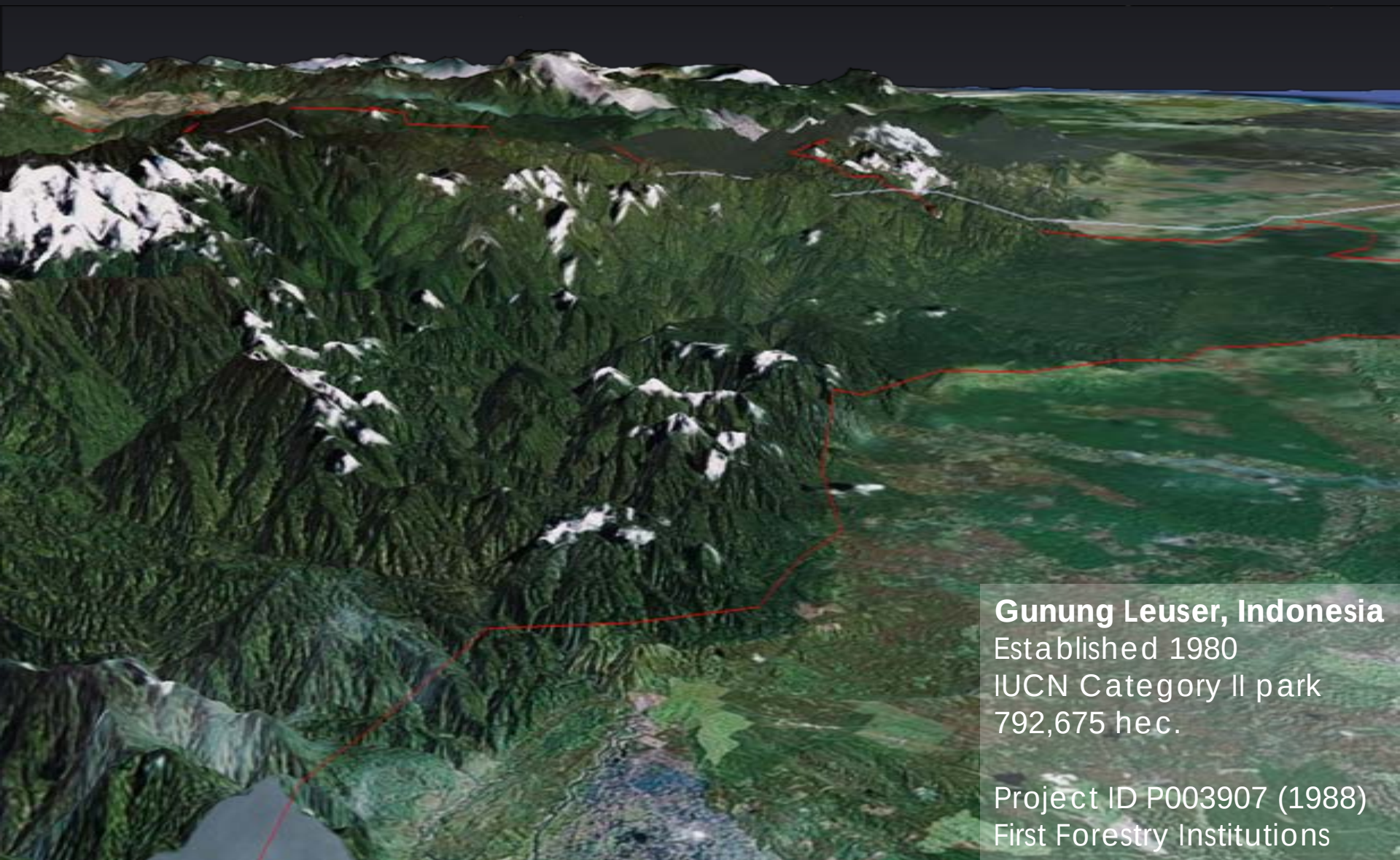
Some protected areas appear to be effective



Clearing and fires in Rondonia, Brazil



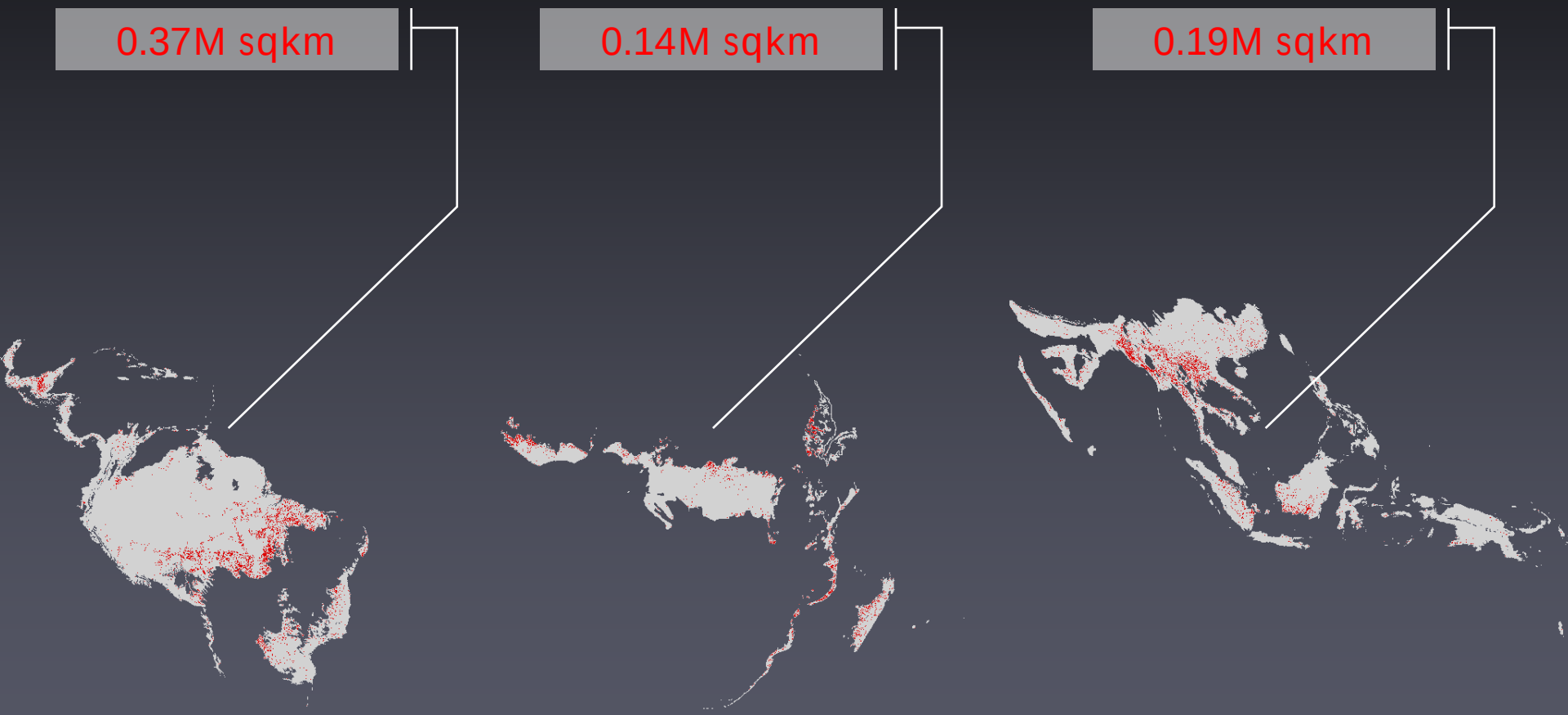
but protection may be due to terrain, not law



Gunung Leuser, Indonesia
Established 1980
IUCN Category II park
792,675 hec.

Project ID P003907 (1988)
First Forestry Institutions

Fires: The only consistent, high resolution global measure for 2000-2008

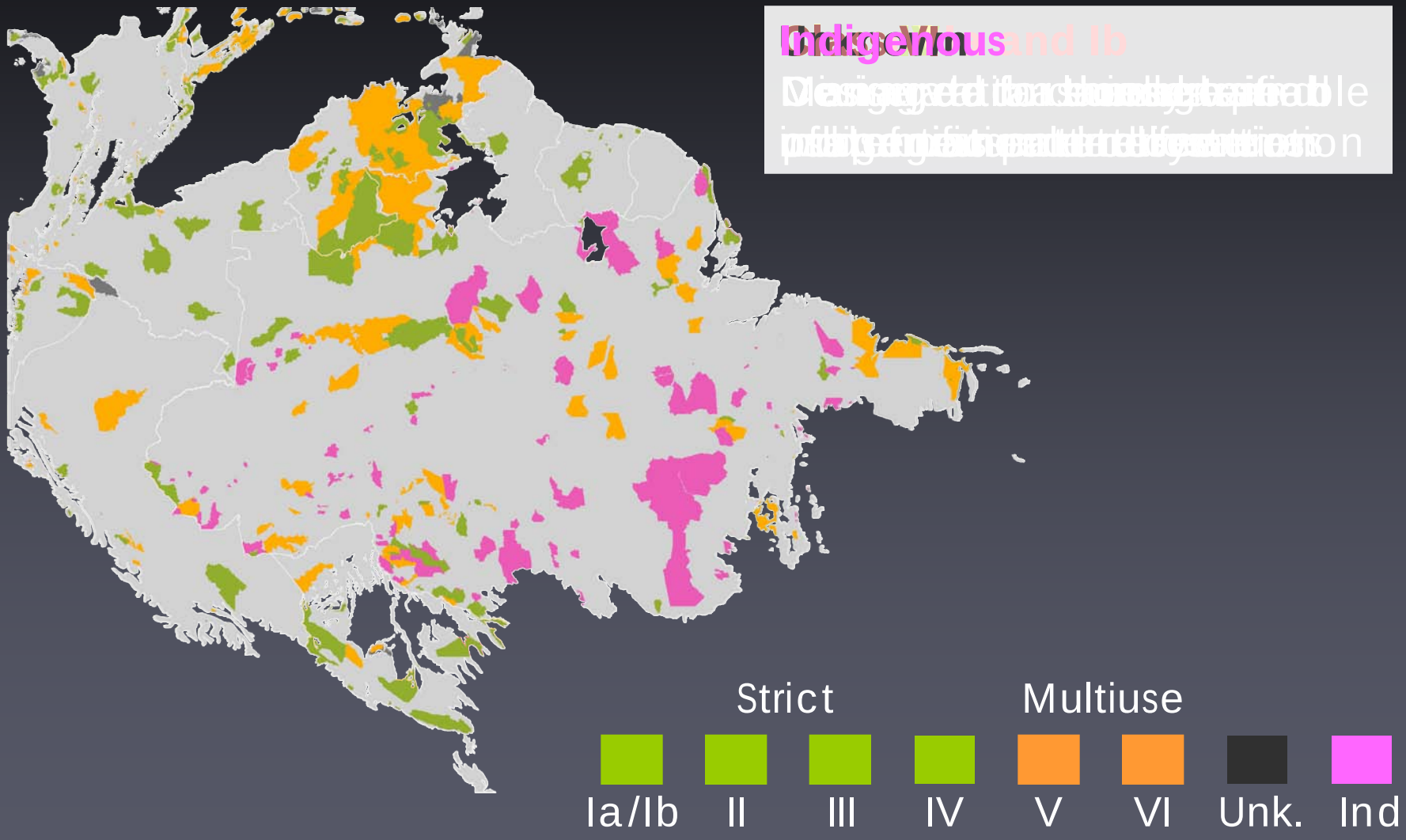


Some 0.7M sqkm of tropical forest fire affected area (2000 to 2008)

High confidence fires derived from over one million MODIS active fire data scenes

Morton *et al* (2008) Agricultural intensification increases deforestation fire activity in Amazonia. *Global Change Biology* 14, 2262-2275

Protected area management categories



UNEP, IUCN (2009) World Database on Protected Areas (WDPA) Annual Release 2009

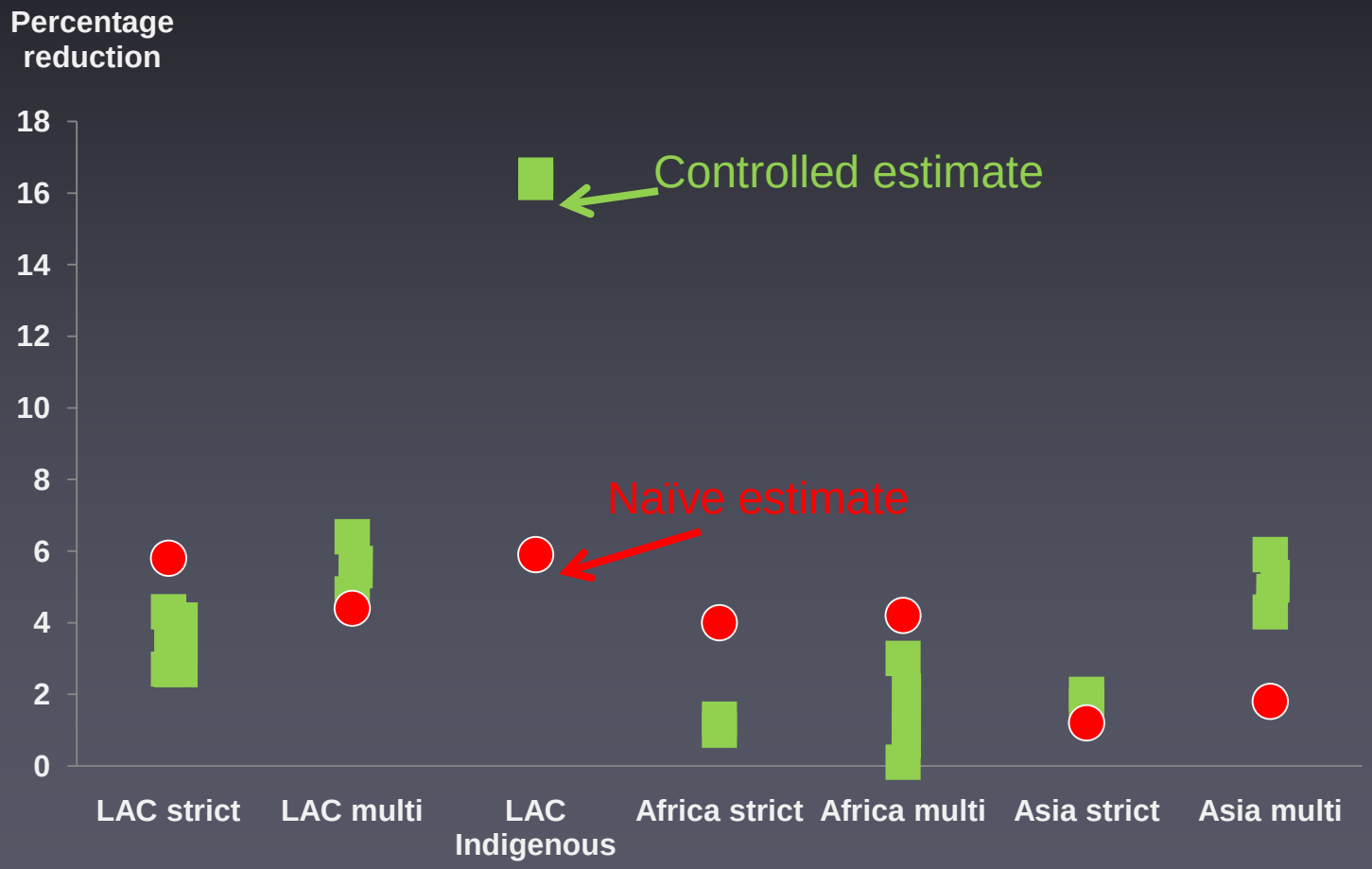
Mean impact: all PAs established before 2000

Avoided fire area as a percentage of the total protected area
Avoided fire % = Non-protected fire % - Protected fire %

Region	Protection	Naïve comparison	Controlled comparison
L. America	**Strict**	5.8%	2.7% - 4.3%
	Multiuse	4.4%	4.8% - 6.4%
	Indigenous	5.9%	16.3%-16.5%
Africa	**Strict**	4.2%	1.0% - 1.3%
	Multiuse	3.1%	0.1%-3.0%
Africa	**Strict**	(post 1990 PAs)	4.4%-5.5%
Asia	**Strict**	1.2%	1.7% - 2.0%
	Multiuse	1.8%	4.3% - 5.9%

These % areas are for the 8 year period 2000-2008

Mean impact: all PAs established before 2000



Conclusions

Protected areas generally have significantly lower deforestation than comparable non-protected areas

Multi-use protected areas generally provide at least as much deforestation reduction (in absolute terms) as strict protected areas.

Indigenous areas have a very high protective impact

Rigorous evaluation methods can give very different results from naïve approaches

Caveats

Fires are an imperfect proxy for deforestation

We don’t measure degradation

Protected areas serve many other functions other than deforestation protection

Establishment of PAs in remote areas may be an effective way to prevent future deforestation as pressure increases

For further information

Download the report (Evaluation Brief 7) at
www.worldbank.org/ieg/climatechange

Contact
Kchomitz [at] worldbank.org

For background reading, download *At Loggerheads? (Policy research report on tropical forests) at:*
www.worldbank.org/tropicalforestreport

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