

Session 3 :  
Promoting direct action to safeguard and  
restore biodiversity and related ecosystem services

## Systematic conservation planning

Daniel P Faith  
The Australian Museum

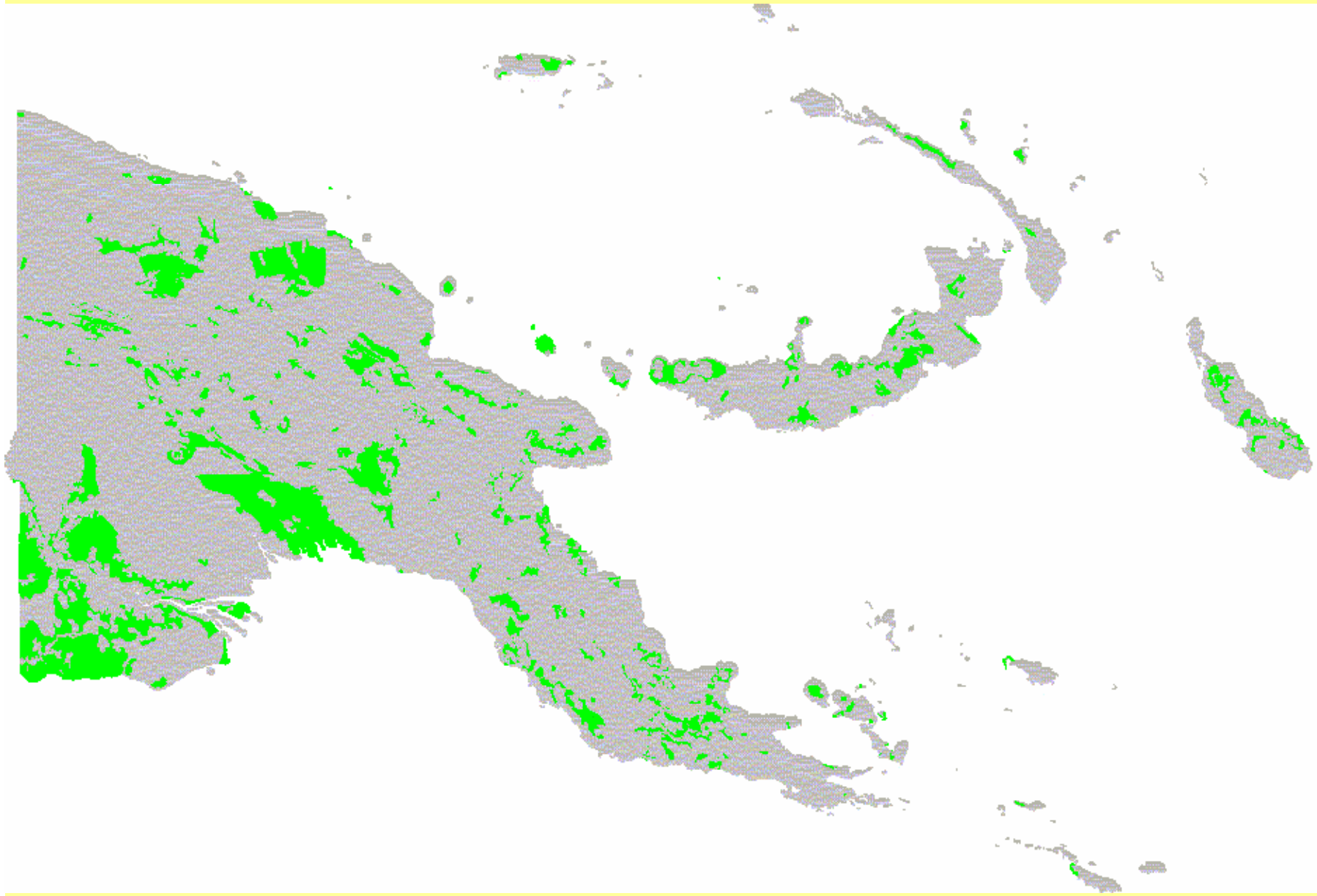
COP10 Pre-conference  
March 21-22, Nagoya

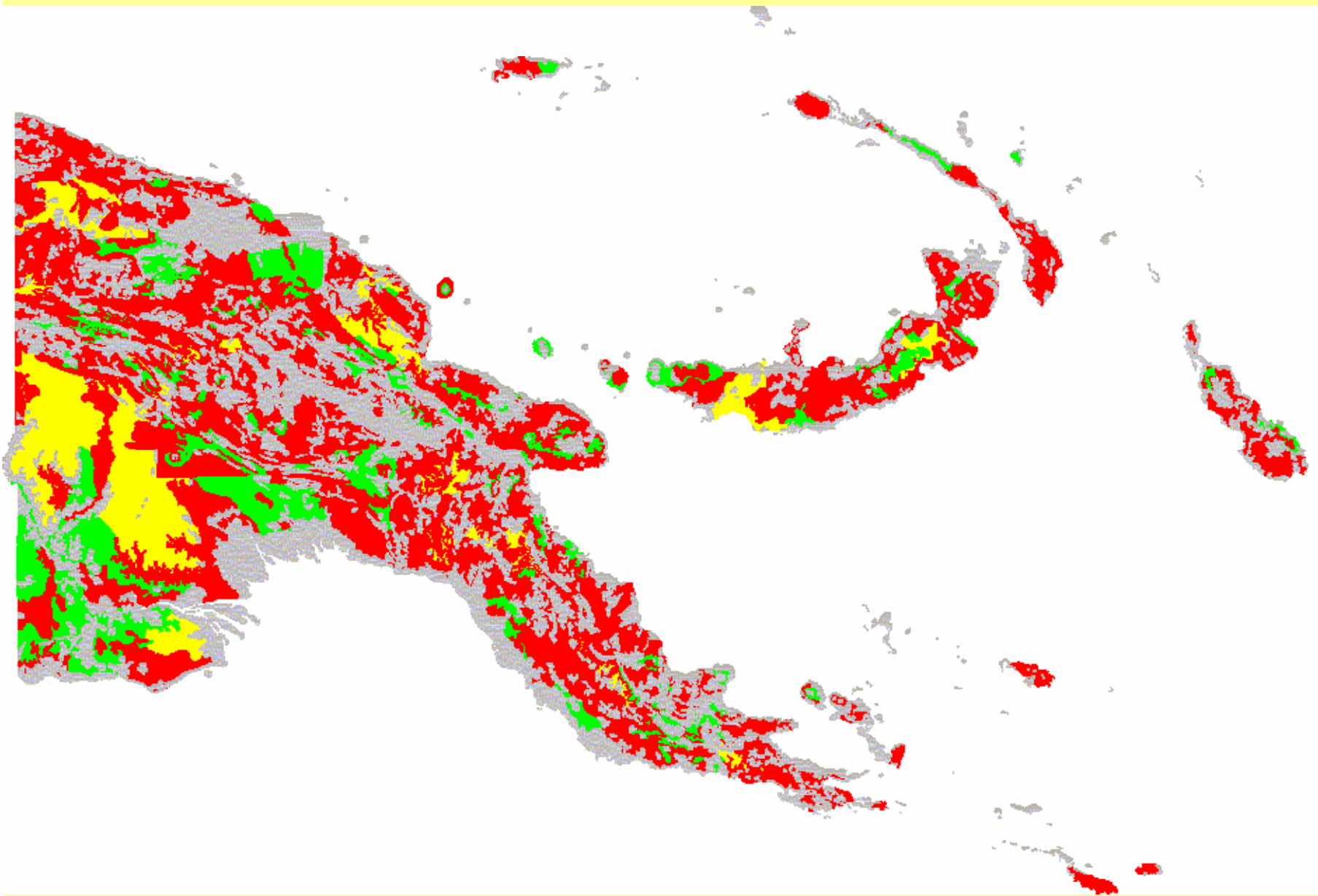
# The role of systematic conservation planning\*

= spatial planning approaches that balance biodiversity conservation with other needs of society  
("efficient"; "net benefits"; optimising trade-offs and synergies)

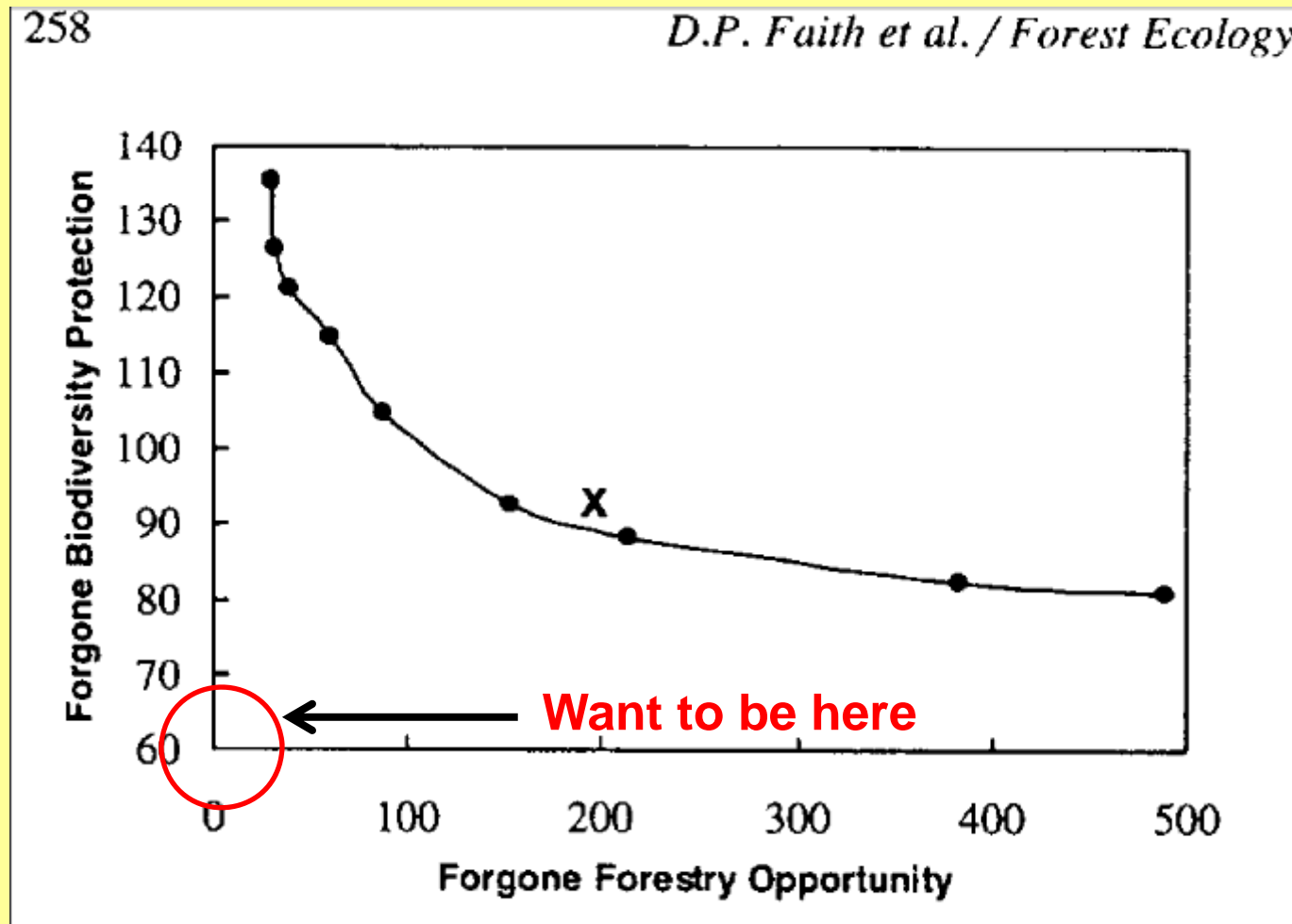
\*e.g.,

- Margules, C. and Pressey, R. (2000) Systematic conservation planning. *Nature*
- Sarkar, S., R.L. Pressey and D.P. Faith et al., (2006) Biodiversity conservation planning tools: present status and challenges for the future, *Annual Review of Environment and Resources*.
- Wilson et al (2009) Setting Conservation Priorities. The Year in Ecology and Conservation Biology, 2009: *Ann. N. Y. Acad. Sci.*





# The role of systematic conservation planning (“SCP”)



a challenge – capturing values of biodiversity, including option values

UNEP/CBD/SBSTTA/14/10

Proposed **Mission**:

...to ensure coherent implementation of the Convention on Biological Diversity and achievement of its three objectives by promoting “**Urgent action to halt the loss of biodiversity**” and,

“By 2020, to:

reduce the pressures on biodiversity;

prevent extinctions;

restore ecosystems; and

enhance ecosystem services, while equitably sharing the benefits, thus contributing to human well-being and poverty eradication....”

UNEP/CBD/SBSTTA/14/10

and we see 20 suggested targets....

and a stated need to:

“Pursue ....the further development of measures (or specific *indicators*) in monitoring progress towards selected *targets* as indicated in annex II”

Perhaps systematic conservation planning can link to one or more *indicators*, and perhaps also form an over-arching guideline for integrating various goals and targets.....

and even help to reduce rate of biodiversity loss

## The role of systematic conservation planning

is to help balance all of these goals and needs of society

David Cooper referred to a key challenge - “integrating biodiversity into broader social and economic agendas”

...and provide consistency with other agreed major globally agreed objectives such as those embodied in the Millennium Development Goals

Spatial planning and SCP  
already prominent in the UNEP/CBD/SBSTTA/14/10  
document:

**Target 2.**

“Reflecting the *values of biodiversity* in the planning processes of governments at all levels, including ...*spatial planning*...

.... Values of biodiversity and ecosystem services are not limited to financial values.

....Tools are also available for integrating biodiversity into spatial planning exercises through the mapping of biodiversity ecosystem services and *systematic conservation planning*.”

“Possible indicators for this target include the number of countries with *biophysical inventories of biodiversity* and ecosystem services”

## Spatial planning and SCP already prominent in the document:

**Strategic Goal B. Reduce the direct pressures on biodiversity and promote sustainable use.**

Calls for

“more efficient use of land, sea and other resources, through better *spatial planning*. This way, the inevitable tradeoffs between production on the one hand and maintaining ecosystem functions and resilience on the other can be minimized.... Further, such efforts can help to identify those *situations where significant biodiversity gains can be made for relatively little cost*.

## Spatial planning and SCP already prominent in the document:

**Target 5** By 2020, the loss and degradation of forests and other natural habitats is halved

States that

“Emphasis should be on preventing loss of primary forests and other high-biodiversity value habitats,”

With milestone –

“*spatial planning tools* are made available for wide use”

Spatial planning and SCP  
already prominent in the document:

**Strategic Goal C. Safeguard ecosystems, species and genetic diversity**

States that:

“immediate actions, such as .... *land use planning* approaches, and other targeted conservation interventions in the broader land- and seascape, can help conserve biodiversity and critical ecosystems.”

## Spatial planning and SCP already prominent in the document:

**Target 11.** By 2020, at least 15% of land, freshwater and sea areas, including the areas of particular importance for biodiversity, have been protected through *representative networks* of effectively managed protected areas ....

Calls for

“Protected areas should be integrated into the wider land- and seascape, and relevant sectors, *bearing mind the importance of complementarity and spatial configuration.* ”

[ “complementarity” is the basis for efficient balanced planning ]

In fact, spatial planning and SCP are relevant to other targets as well -

**Target 12.** The extinction of *known* threatened species has been prevented.

**Target 19.** By 2020, knowledge and technologies relating to biodiversity, its value and functioning, its status and trends, and the consequences of its loss, are improved and widely shared.

“Further efforts are also needed, at multiple scales, to *improve biodiversity-related knowledge* and reduce uncertainties around the relationship between biodiversity change, ecosystem services and impacts on human well-being. *This requires substantial investment in global and national biodiversity observation networks, implementation of the Global Taxonomy Initiative, and further investment in research, including modelling.*”

# Biodiversity and ecosystem services

The big biodiversity gain from considering ecosystem services is that it gives us more reason to retain intact, natural places

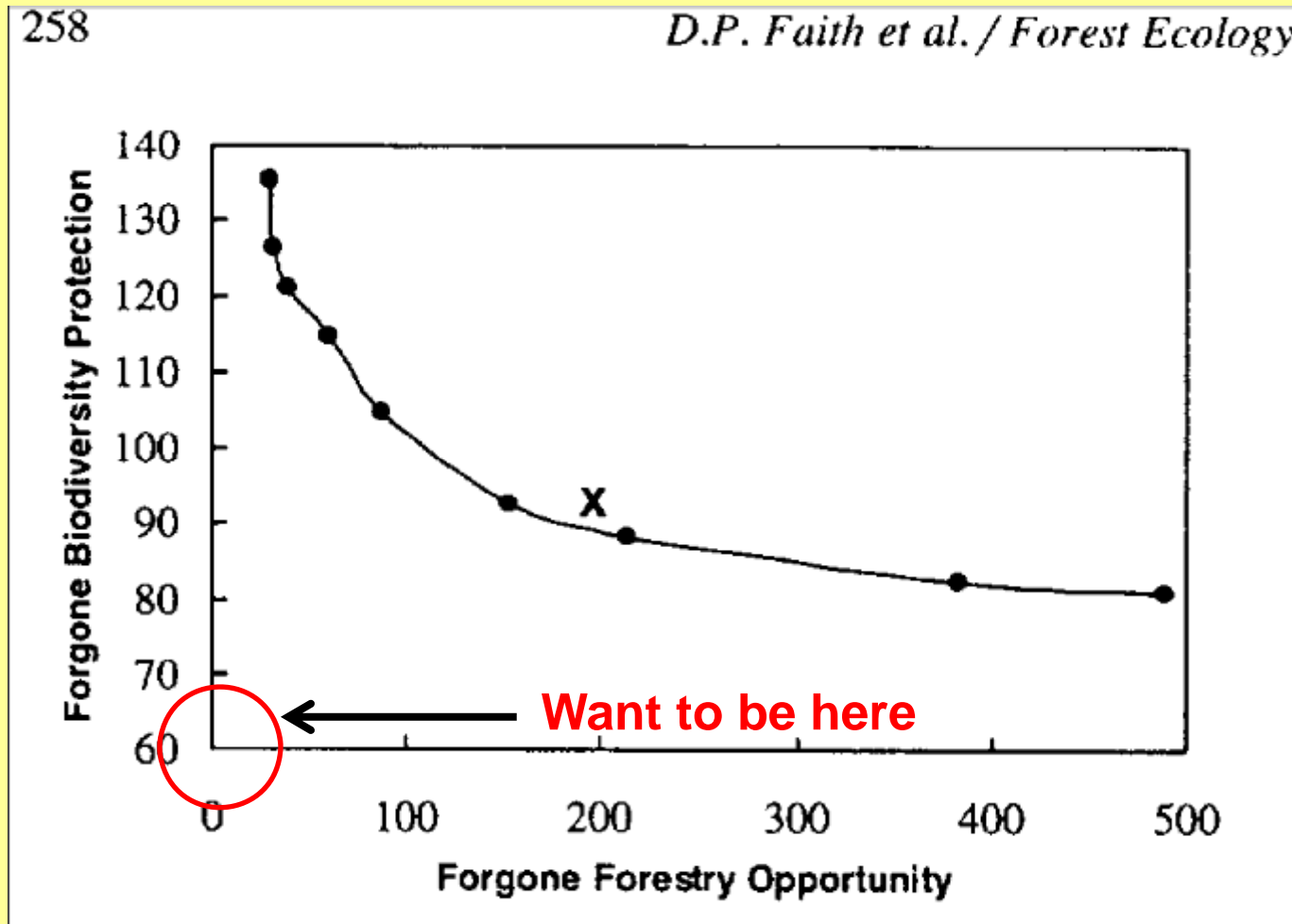
And this can help protect elements of biodiversity

But also broad-scale conflicts/trade-offs are apparent, “The general increase in provisioning services over the past century has been achieved at the expense of decreases in regulating and cultural services, and biodiversity” [Carpenter et al].

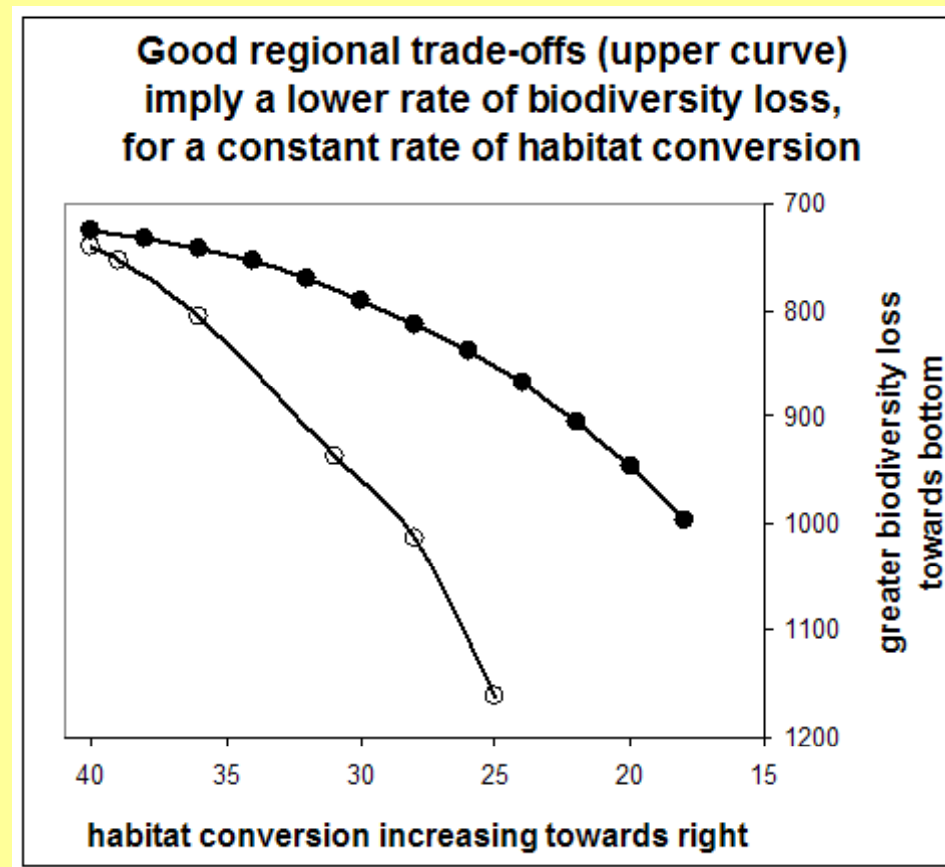
Similarly, Egoh et al. concluded that “while biodiversity is seen as underpinning and ecosystem services is seen as a way to justify biodiversity conservation, it is acknowledged that the match between the two is not strong.”

**But there are positive messages even when pursuit of services involves trade-offs with biodiversity conservation goals -**

# The role of systematic conservation planning (SCP)



# two land-use change curves for Panama



constant rate of habitat loss (horizontal axis)

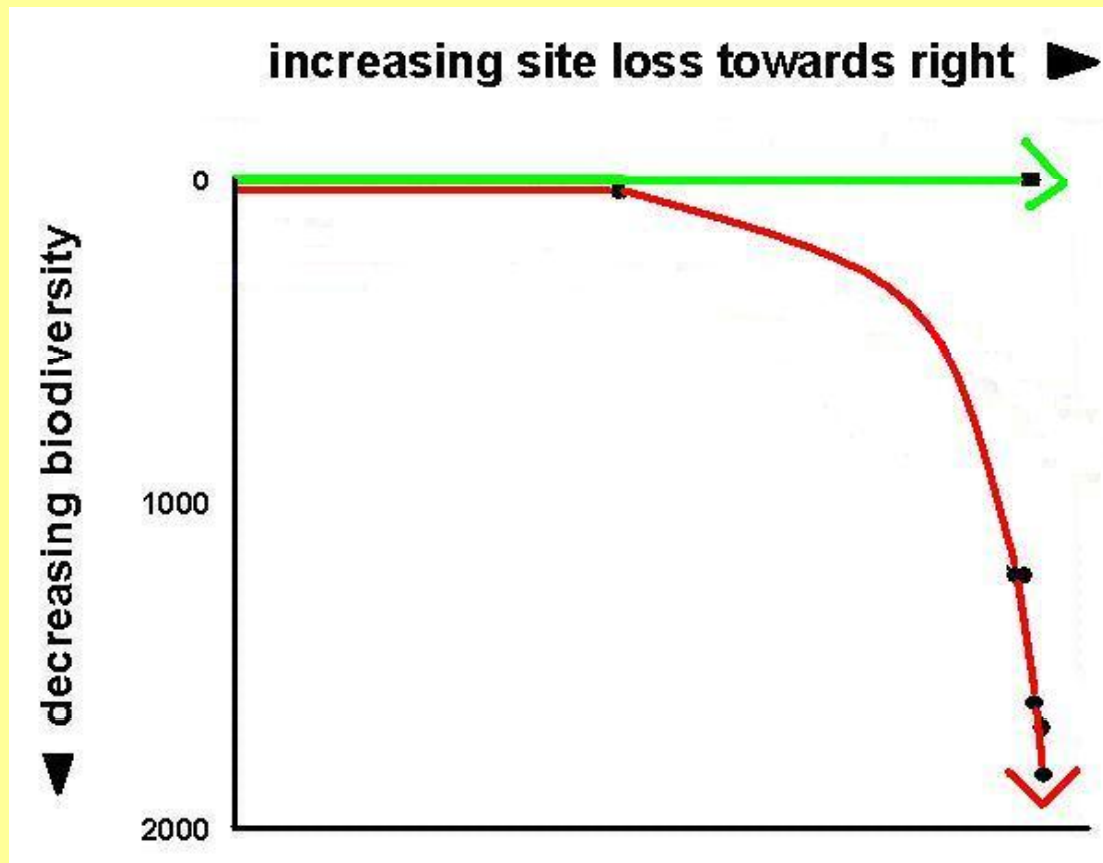
Means increasing rate of biodiversity loss (vertical axis).

**lower curve** - choice of places for conversion is not balanced with conservation needs, and disproportionately targets certain habitat types.

**upper curve** - new human-use lands are selected using SCP, so as to minimize conflict with regional biodiversity conservation.

Scenario implementing a systematic conservation plan (SCP) for Milne Bay, Papua New Guinea (**green trajectory**).

Achieves a **reduced rate of biodiversity loss**, relative to a business-as-usual scenario (red trajectory).



green SCP trajectory - protection of Key Biodiversity Areas plus selected additional complementary, low cost, localities

assumes that there is ongoing conversion of un-protected localities, in order of attractiveness for non-conservation land uses, and without regard to biodiversity values. Conversion is assumed to imply loss of that locality's biodiversity.

Faith, D.P. & Ferrier, S. 2005. Good news and bad news for the 2010 biodiversity target. *Science Online*.  
Williams, K.J., et al 2006. Milne Bay Province Terrestrial Biodiversity Conservation Outcomes. CSIRO & C.I.

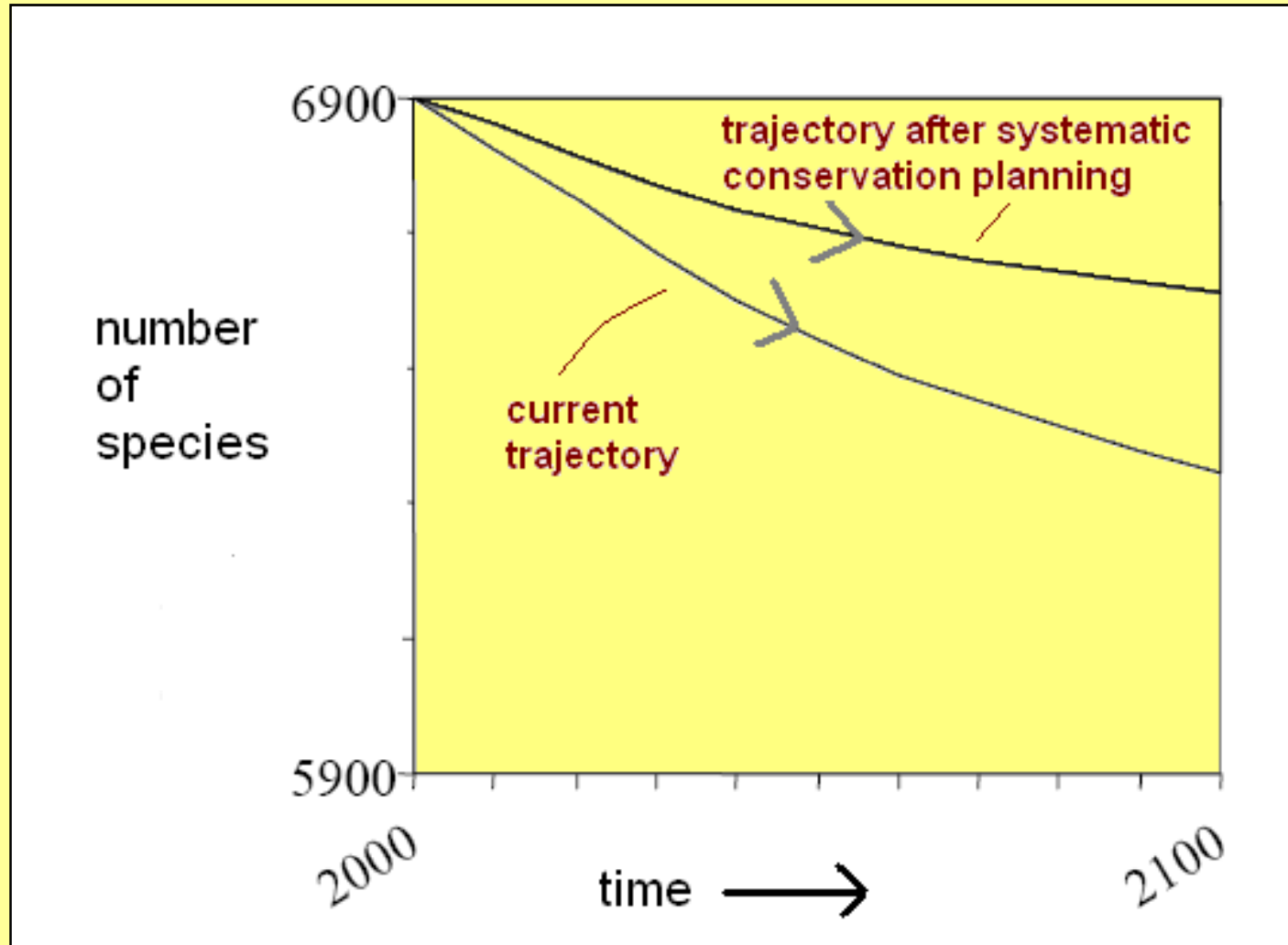
The 2nd DIVERSITAS Open Science Conference (DIVERSITAS OSC2),  
Cape Town, 14-16 October 2009.

Quantitative projection of plant species loss for 1697 taxa of Japanese  
vascular plants and its implication for achieving the 2010 biodiversity target  
Hiroyuki Matsuda, Tetsukazu Yahara and Taku Fujita

....the Japanese Red Data Book compilation project monitored changes  
of population size during the past ten years for 1,697 threatened plant  
taxa in each of 3,781 map grids of ca.100 km<sup>2</sup>. ...This massive data set  
enabled us to carry out the world first quantitative projection of plant  
species loss at national level with stochastic simulations. ....553 taxa  
(7.9 % of the Japanese vascular flora; including 289 endemic to Japan)  
were projected to go extinct during century, if the declining trends over  
the last decade continue.

Our monitoring also suggests a pathway to reduce this rate of loss and  
so address the 2010 biodiversity target of "significant reduction in the  
rate of loss of biodiversity". **We used systematic conservation  
planning to identify a set of sites whose protection would imply a  
reduced rate of extinctions.**

Upper curve – systematic conservation planning scenario with reduced rate of biodiversity loss



## One recommendation –

ensure that one or more indicators give credit to new implementations of systematic conservation planning

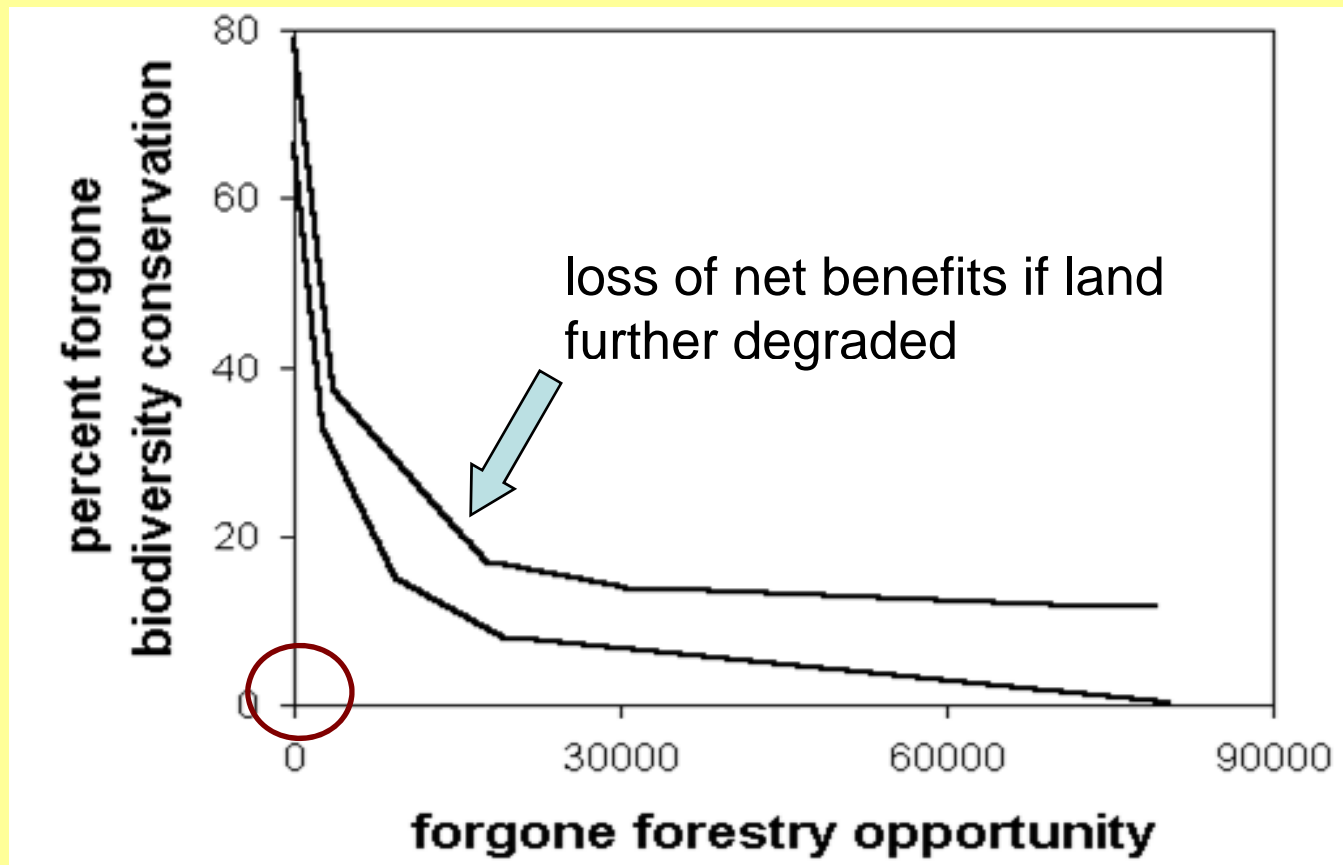
*Simple indicators* – credit any new implementation or enabling of systematic conservation planning approaches

*More informative indicators* –

measure consequent changes in rate of biodiversity loss

record success in avoiding tipping points that foreclose options for balanced planning

Papua New Guinea –  
sustainability tipping points  
some losses of intact places is ok,  
but then we lose flexibility to find balanced outcomes



Cost-effective biodiversity planning. *Science* 293 [online] (2001)  
<http://www.sciencemag.org/cgi/eletters/293/5538/2207#356>

One recommendation –

ensure that one or more indicators give credit to new implementations of systematic conservation planning

But also another recommendation –

ensure that one or more indicators addresses the need to effectively measure biodiversity as part of systematic conservation planning.....

# If biodiversity not measured well...

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*D.P. Faith et al. / Forest Ecology*

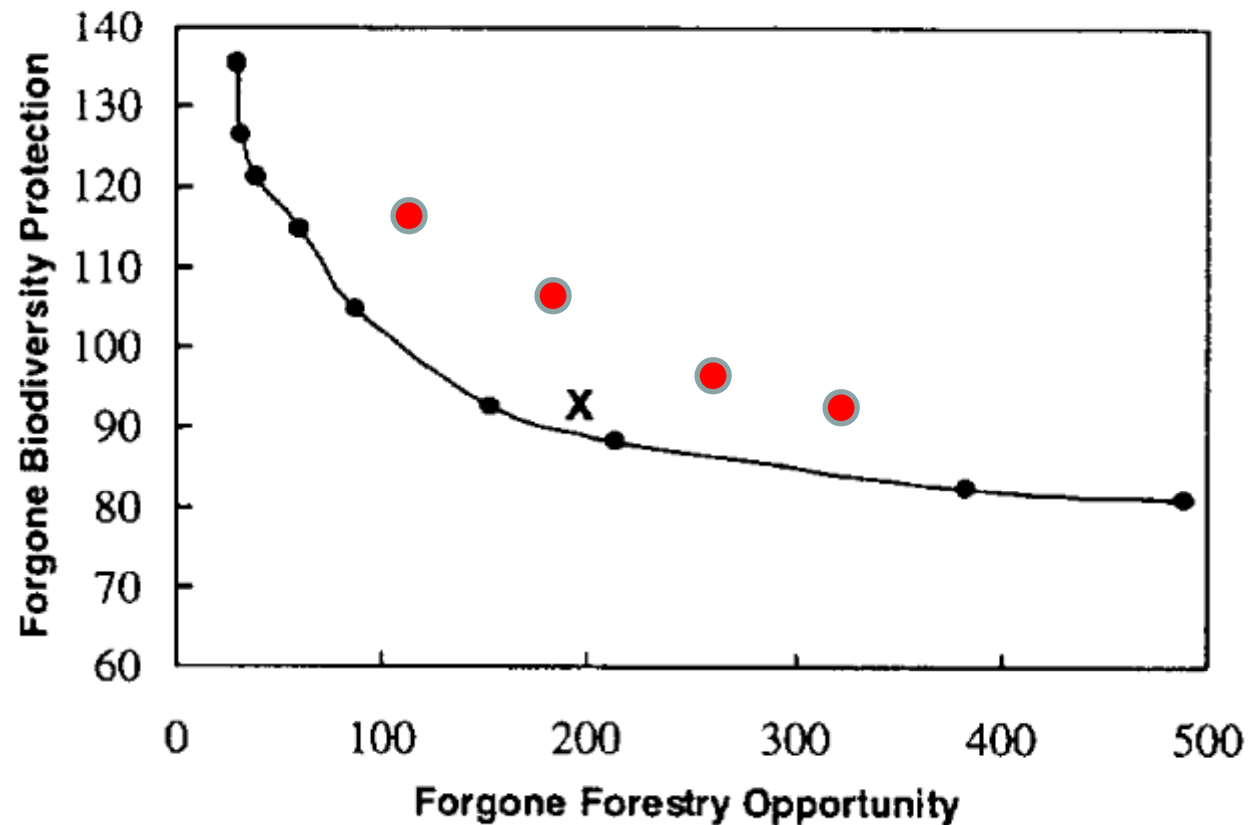


Fig. 3. A trade-off curve in which the points from left to right represent solutions for weights,  $w$ , on forestry of 1.0, 0.8, 0.7, 0.5,

two recommendations –

ensure that one or more indicators  
give credit to new implementations  
of systematic conservation planning

ensure that one or more indicators  
addresses the need to effectively  
measure biodiversity as part of  
systematic conservation planning.....

Additional slide for questions follows

# The either–or problem

Armsworth et al. [Conserv Biol 2007], in arguing for a focus on ecosystem-services, asked: “Put bluntly, *will we achieve greater conservation success by protecting nature for its own sake or for our own sake?*”.

Marris [Nature 2009] talks about “increased attention could also highlight the *flaws of the ecosystems-services approach, one of which is its uncertain ability to protect biodiversity*: in some cases a biodiverse ecosystem does not necessarily provide services that are more financially valuable.”

Mace et al. [COSUST in press]

“Many will argue that in an uncertain world, a key concern will be to maintain biodiversity so as not to foreclose the options open to future generations. This would entail a goal of no overall loss of biodiversity. While probably desirable we suggest this is unlikely to be achievable and as a goal it could conflict with other priorities.”