

The time path of investments for the management of protected areas

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QUESTION

How does management cost change through time?

ABSTRACT

Creating and protecting areas is expensive and that doesn't stop after acquisition. Management costs may outweigh other cost components (such as acquisition cost) and become the main driver of investments on the long term.

Yet, to date, most studies estimate management costs at one point in time, across sites that may have been protected for differing amounts of time.

An overview of what has been published:

Hypothetical cost survey:
Frazee et al. 2003, Balmford et al. 2003, Bode et al. 2008

Proxy (agriculture, gross revenue):
Cawardine et al. 2008 and 2010, Naidoo and Iwamura 2007

Actual costs, still snapshot study:
Armsworth et al. 2011



MANAGEMENT COST PATTERNS

First results for Tennessee... other states on their way!

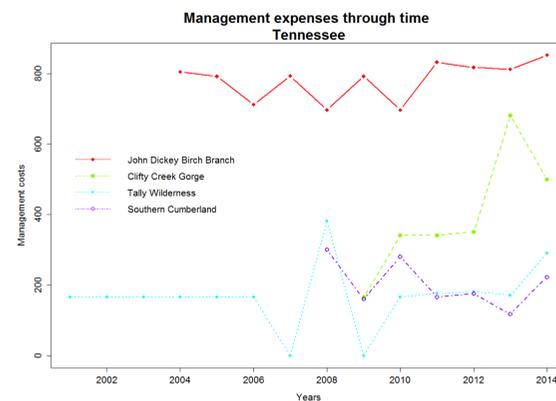


Figure 1.
Time path of investments for TNC protected areas in Tennessee, Appalachian forests (in dollars)

For three of these areas, management costs are consistent through time: this is due to TNC staff only visiting the areas few times a year, with no other

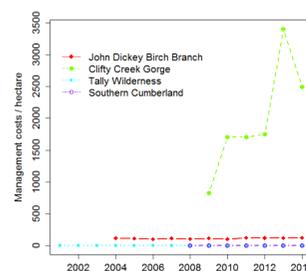
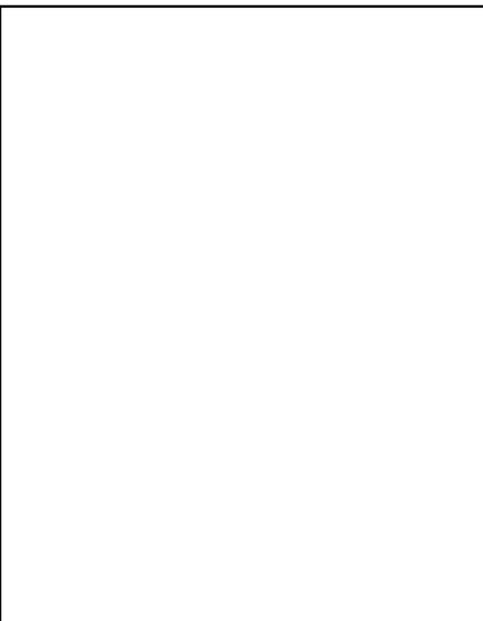


Figure 2.
Investments per hectares

Management taking place there. For Clifty Creek Gorge, where there is active management (trash removal, fencing, infrastructures maintenance), costs are not constant through time...

We are currently obtaining data for 42 other areas so as to be able to **identify trends and fit them to areas characteristics.**



Survey.
Here is an exemplar of the questionnaire we use to interview TNC managers

Why is the “snapshot” approach potentially a problem?

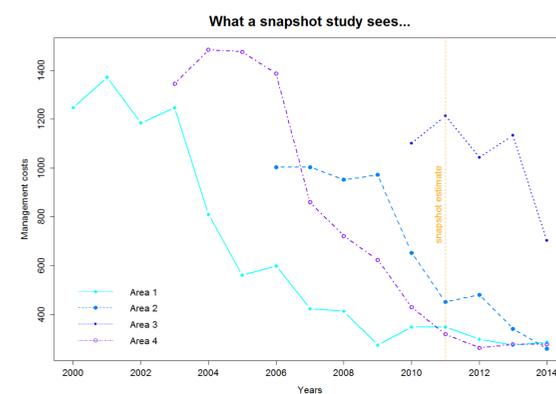


Figure 3.
These investment curves all follow the same pattern through time, with an initial impulse and then a stabilization in 8 years after acquisition.

Most studies describe or estimate management expenditure at one point in time. This “**snapshot**” approach can potentially lead to erroneous estimates: see fig. 3.

An alternative is to try to relate management costs to various site characteristics **through regression analysis including “time since protection”**. This comes down to assuming:

1. an identical pattern of investment path for all the sites
2. that this pattern is linear.

We will highlight the type of errors resulting from such simplifications and the consequences they have on the accuracy of cost estimations, which in turn translates into different choices of prioritization for land acquisition.

TAKE HOME

A better understanding of actual management costs through time is important to ensure that commonly used proxies and other estimation approaches are accurate as well as to be able to make informed decisions regarding future acquisitions of areas to protect.



WHAT NOW?

- What kind of error results from treating managements costs as if constant through time?
- How are ecological benefits related to management costs on protected areas?