Figure 1 - Areas of the world affected by point data in the 2009 WDPA. Buffered points cause the colored areas to be classified either as a new IUCN categorized protected area (green), a higher IUCN category than that derived from the polygon data (red), an IUCN categorized area where the polygon data show only a non-IUCN area, or a new non-IUCN area (blue).

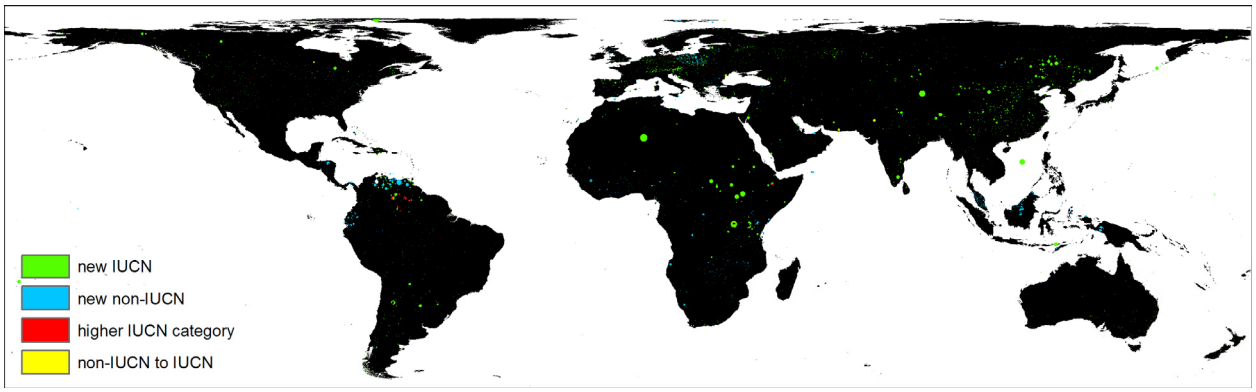


Figure 2 – Largest proportional change in ecoregion representation when converting a protected area polygon to a buffered point. For example, an ecoregion declining from 0.5 of a polygonal protected area to 0.45 in the buffered point version would equal a change of 0.05. The line indicates the level below which 95% of the protected areas lie.

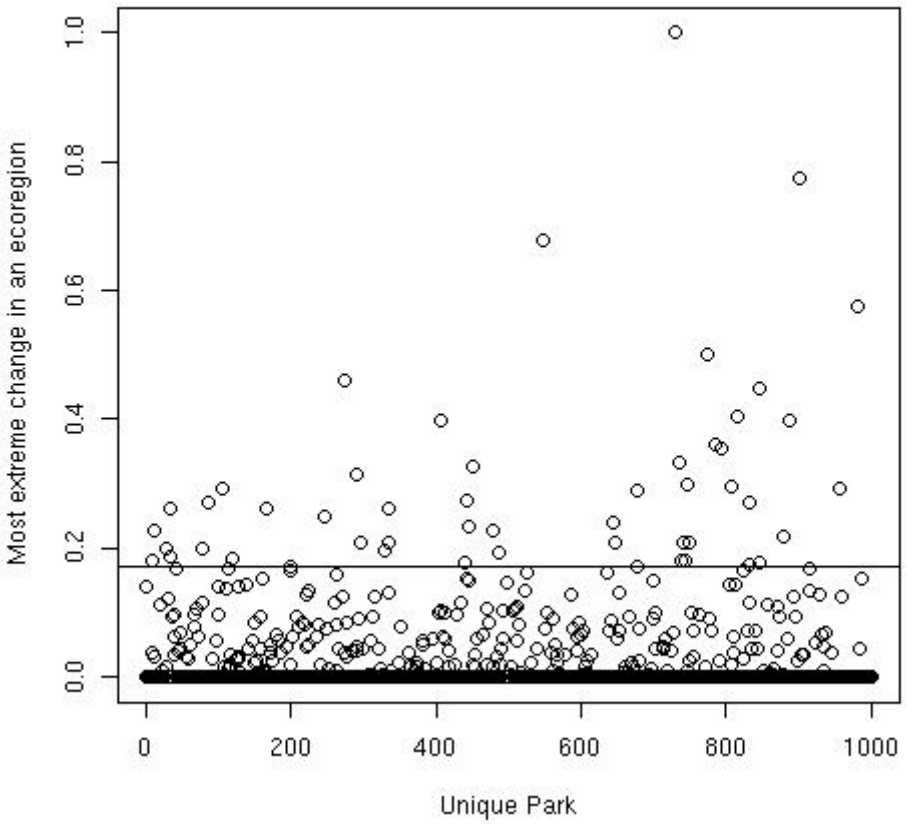
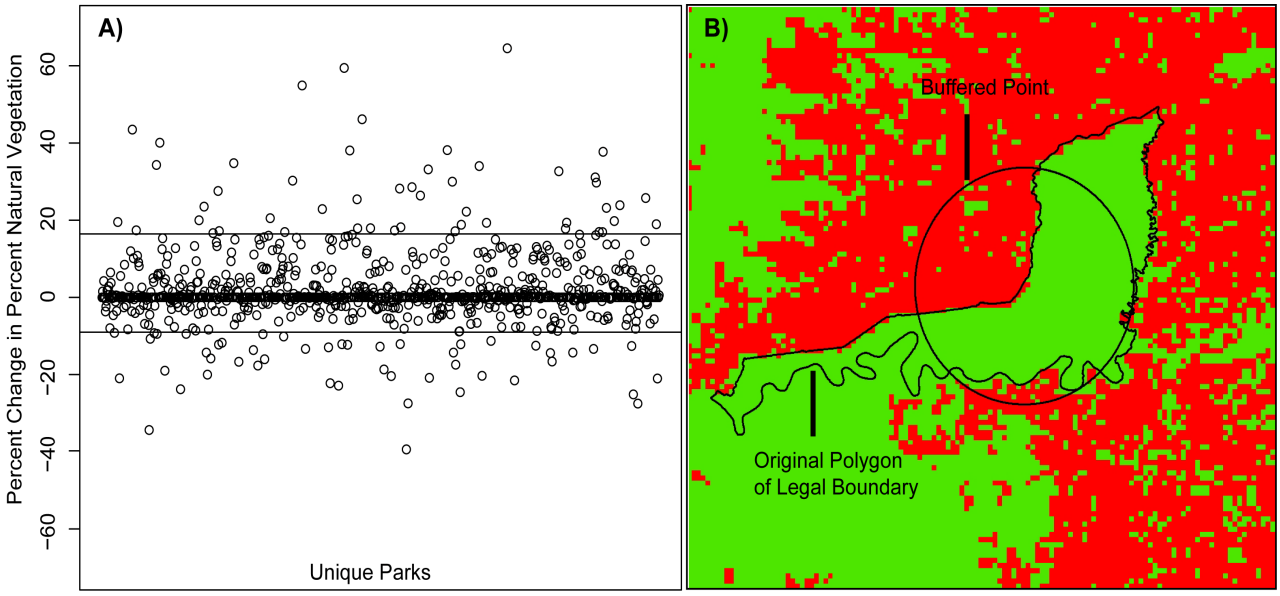


Figure 3 – Effect of buffered point data on land cover analyses. **A**) Percent natural vegetation in the polygon minus percent natural vegetation in the buffer point. The horizontal lines bound the middle 90% of the data. Positive values on the y-axis indicate the polygon representation of the park contains more natural vegetation than the buffered point representation, while negative values indicate the opposite. **B**) Iguazú National Park, on the border of the Brazilian state of Parana and the Argentine province of Misiones. Red indicates human modified land cover, while green indicates natural land cover.



Supporting text for Figure 3:

In the main text we report errors incurred with the use of buffered point data when assessing ecoregion coverage, a coarse-resolution dataset. However, besides determining whether protected areas are placed in representative locations, another other major question facing conservation biologists is assessing just how effective protected areas truly are (e.g., Joppa *et al*. 2008). Most studies concerned with this question use avoided deforestation as a proxy for protected area impact. Unlike ecoregion data, deforestation data are often provided in resolutions

of one km^2 or less. How would the use of buffered point data affect a study using data such as these?

In Figure 3, we replicate the analysis presented in Figure 2 above and referred to in the main text. This time, however, we use land cover data provided at a resolution of $1km^2$ (Bartholome & Belward 2005). By calculating the percent of each park (represented by a polygon) that is composed of natural vegetation, and the same for each park's buffered point, we show the potential errors in assuming a circular buffer. In Figure 3A, the difference between the two is on the y-axis, and one can readily see that the error can be quite large, and in either direction. In other words, a circular buffer representation of a protected area can over or under estimate the amount of remaining natural vegetation by as much as 60%. Figure 3B provides a case study of this phenomenon for Iguazú National Park. There, deforestation has occurred extensively outside the park boundary, with large amounts of natural vegetation remaining within. Representing the park boundary with a circular buffer grossly misrepresents the actual land cover contained in the park.

Bartholome, E., Belward, A. (2005). A new approach to global land cover mapping from earth observation data. *Int J Rem Sens*, 26, 1959–1977.