**Methodology for Mapping Human Impact.**

Research Summary

**The Human Footprint and the The Last of the Wild:**

ERIC W. SANDERSON, MALANDING JAITEH, MARC A. LEVY, KENT H. REDFORD,

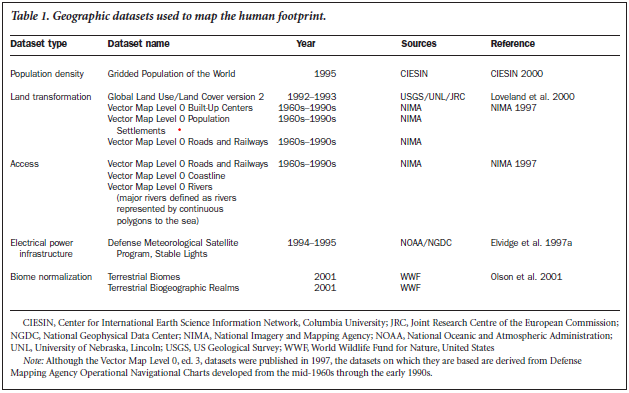
ANTOINETTE V. WANNEBO, AND GILLIAN WOOLMER.

**INPUTS**

Monitor changes in land development-- Historical land use land cover datasets, aerial photography, satellite imagery etc would be very useful.

* Development of resource based activities
* Development of tourism companies in the areas
* New communities
* New named places (could indicate more people or more regular travel in the area?)
* Road building-- can assess the presence 0r pervasiveness of invasive species, connectivity, fragmentation, level of human activity etc. Differentiate between the different road types?
* Trail infrastructure?
* Population statistics, population density new populated areas
* Built up areas and NIMA dataset?
* Monitor size and “remoteness” of areas, and how those areas are being disturbed.
* Electrical power infrastructure
* Size of parks/ conservation areas and how many people living within 50km of it? ( high density and small parks lead to higher extinction rates)
* # of hunting/ trapping licenses in the area by species. # of total hunted per year over time.
* Changes in hydrology

**Potential Datasets and categories**



**Methodology**

* A consistent map projection with a CONSISTENT set of boundaries/ borders
* A grid system (1km x 1km?)
* Code each dataset- would we need to do a separate on for every taxa? Then summarise the impact for a final priority score, (0-10 or 0-20?)
* How can we determine the effect of population density and effect on the habitat modification for each taxa?
* “In this study,we used a continuum approach, in Which human influence scores for densities between 0 and 10 persons per km2 increased linearly from 0 to 10 and the score above 10 persons per km2 was held constant at 10”
* Consider a habitat fragmentation index?
* Built Up index: Maximum score of 10 to built up environments. 6, 7, 8 to agriculture (depending on level of input), 4 to mixed use land cover, 0 to all other land cover (considered natural)
* Roads:
  + 2km buffer around roads-- is this reasonable for all species? Can we customize based on taxa. Score of 8 for human impact. It is likely that this is an overestimation.
  + Other access- humans walking in the landscape. How far can people get. Is this important? 2-15km away from a road have a value of 4 indicating a modest influence with intermittent use.
* Hydrology
  + (MAJOR rivers and lakes that could support human tranportation ( how much of an affect does a canoer have on the landscape or behaviours of the species of interest? How many poeple would have to be in the area for there to be an effect?
  + dams?
* Shoreline NATURAL vs NOT
* Light pollution ( a proxy for population distribution)
  + 10 for areas with lights visible more than 89% of nights
  + 8 to areas with lights visible 40-88%
  + 4 to areas with lights visible less than 40%
  + 0 for areas where no lights are visible.
  + What is the buffer area for that?
  + Does forest density or distance away have an effect? -- maybe consider doing a viewshed analysis around areas with lights?

**INDICATORS OF WILDNESS**

Aplet G, Thomson J,Wilbert M. 2000. Indicators of wildness: Using attributes

of the land to assess the context of wilderness. In Cole DN,McCool

SF, eds. Proceedings: Wilderness Science in a Time of Change. Ogden

(UT): USDA Forest Service, Rocky Mountain Research Station. Proc.

RMRS-P-15

* Wilderness definition? We are probably going to come up with a definition of our own
* Remoteness
  + Free from influence of mechanical sight, sound, and smell. (human or animal?)
* Uncontroleld Processes
  + Fire suppression, dams, extermination, pesticides, herbicies agriculture, plantation etc?
  + Watershed integrity
  + Altered fire regimes
* Natural composition
  + Invasive specoes
  + Plantations
  + Changes in prey migrations
  + Raods, settlements, power transportation hugely affect the wilderness aspect. “Trails and temporary shelters, features such as were common long before the advent of the white race, are entirely permissible”
* pollution is one of the best studied and best documented of the indicators of wildness.
  + Aquatic and terrestrial nutrient and chemical composition?
  + Light pollution
* **Methodology**
  + Raster based approach indicating the presence or absence of limiting factors within a cell. 1km ^2
  + GRID Module

**Human Population Density and the Future of Biological Diversity**

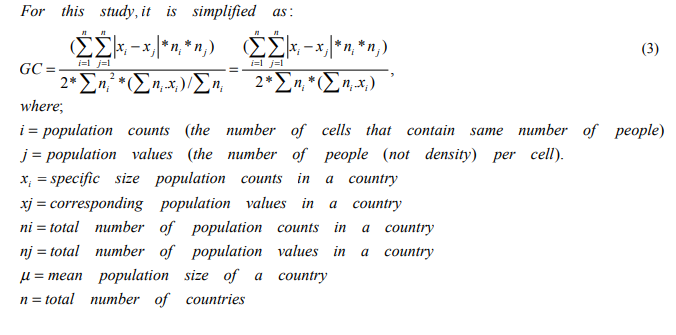
Cincotta RP, Engelman R. 2000.Nature’s Place:Human Population Density

and the Future of Biological Diversity.Washington (DC): Population Action

International.

**A Global Analysis of the Impact of Human Concentration on Species Fragility**

Ram Pandit Dr. David N. Laband School of Forestry and Wildlife Sciences Auburn University

* Population density and specifically household size or dwelling size.
  + A population in a sprawled environment has more negative impacts than than a population that is more dense, living in a smaller area or fewer built structures.
* GINI coefficient to identify sprawl (instead of wealth distribution)
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Further Reading:

* Estimating population density by light pollution.?