2010-04-01

Examining the Impacts of Habitat Fragmentation Along the Western Border of Yellowstone National Park

Alex D. Johnson
Vania Hernandez
Janelle Sands
Matthew Bekker

Follow this and additional works at: https://scholarsarchive.byu.edu/fhssconference_studentpub

Part of the Geography Commons

The Annual Mary Lou Fulton Mentored Research Conference showcases some of the best student research from the College of Family, Home, and Social Sciences. The mentored learning program encourages undergraduate students to participate in hands-on and practical research under the direction of a faculty member. Students create these posters as an aide in presenting the results of their research to the public, faculty, and their peers.

BYU ScholarsArchive Citation
Johnson, Alex D.; Hernandez, Vania; Sands, Janelle; and Bekker, Matthew, "Examining the Impacts of Habitat Fragmentation Along the Western Border of Yellowstone National Park" (2010). FHSS Mentored Research Conference. 50.
https://scholarsarchive.byu.edu/fhssconference_studentpub/50

This is brought to you for free and open access by the Family, Home, and Social Sciences at BYU ScholarsArchive. It has been accepted for inclusion in FHSS Mentored Research Conference by an authorized administrator of BYU ScholarsArchive. For more information, please contact scholarsarchive@byu.edu, ellen_amatangelo@byu.edu.
Examining the Impacts of Habitat Fragmentation Along the Western Border of Yellowstone National Park

Background

Landscape Ecology combines the disciplines of geography and ecology to give a unique spatial approach, which allows extrapolation across scales.

Our area of study is located on the SW border of Yellowstone National Park and the adjacent National Forest. Different land management practices between the National Park and National Forest, in particular, deforestation in the National Forest, can affect the ecosystem in the greater Yellowstone area.

Deforestation is the cutting, clearing, and removal of forest, which causes a less diverse ecosystem. Our goal is to determine how deforestation affects core area, fractal dimension, and percent of landscape on the SW corner of the National Park/National Forest boundary, and therefore the greater Yellowstone ecosystem.

Common Landscape Ecology Terms:
- **Patch**: Surface area that differs from its surroundings in nature or appearance.
- **Edge**: Perimeter of a patch in which environmental conditions differ from the interior or core.
- **Fragstats**: a computer program designed to compute landscape metrics.

Methods

Landscape Metrics help us to quantify different landscapes so that we can better analyze and compare landscape patterns and processes. We chose three metrics to help us compare the deforested area of the National Forest with Yellowstone National Park. These metrics are as follows: Percent of Landscape, Core area, and Fractal Dimension.

**Rule of Landscape (%)LAND**
- By the class level, it measures the percent of the landscape that is covered by a particular class (Ex- % of Forest vs. % of Brush).
- Landscapes that are heavily deforested will have a lower percentage of forest.

**Core Area (CORE)**
- The area within a patch, beyond the specified edge distance or buffer width.
- Species usually have a preference for either core or edge area. Changing the areas, can potentially affect these species.

**Fractal Dimension (FRAC)**
- Measures shape complexity either at the patch, or landscape level.
- Shape complexity is usually simpler when there is a human influence.

Results

After using Fragstats, we found that the percent of forest vegetation in the National Forest decreased considerably due to deforestation.

Deforestation also impacted the total core area of the vegetation types. Patches of forest in the National Park contained more that double the amount of core area than the National Forest.

After performing the Fractal dimension metric, we were able to determine that on average the patches found in the National Forest were less complex.

Conclusion

After analyzing the data from our study area, it is clear to see that current land use practices in the National Forest have altered the ecosystem. Deforestation can have negative impacts on species that rely on large amounts of undisturbed, continuous habitat. Among those species at risk are the grizzly bear, American marten and the northern goshawk. Furthermore, an increase in edge habitat may attract species that thrive in an edge environment. Based on our results, land use practices in the National Forest should be reevaluated to consider its impacts on the greater Yellowstone ecosystem.