

# Quantifying the shifted baseline in breeding bird communities for Native American tribes relocated to Oklahoma



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## Background

- Biodiversity loss reduces human well-being as a lost cultural ecosystem service.
- Loss over time contributes to *generational amnesia* or a *shifted baseline* of appreciation.
- Native American removal and relocation in the 19<sup>th</sup> and 20<sup>th</sup> centuries is an extreme example by moving people to different ecoregions.

## Objective

Our objective was to use beta diversity index to quantify the shifted baseline of familiar breeding birds for Native American tribes re-settled in the Oklahoma Territory from elsewhere in the United States.

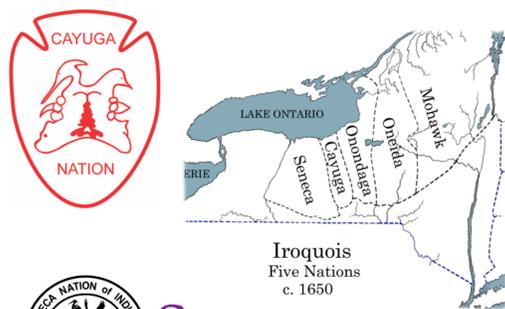
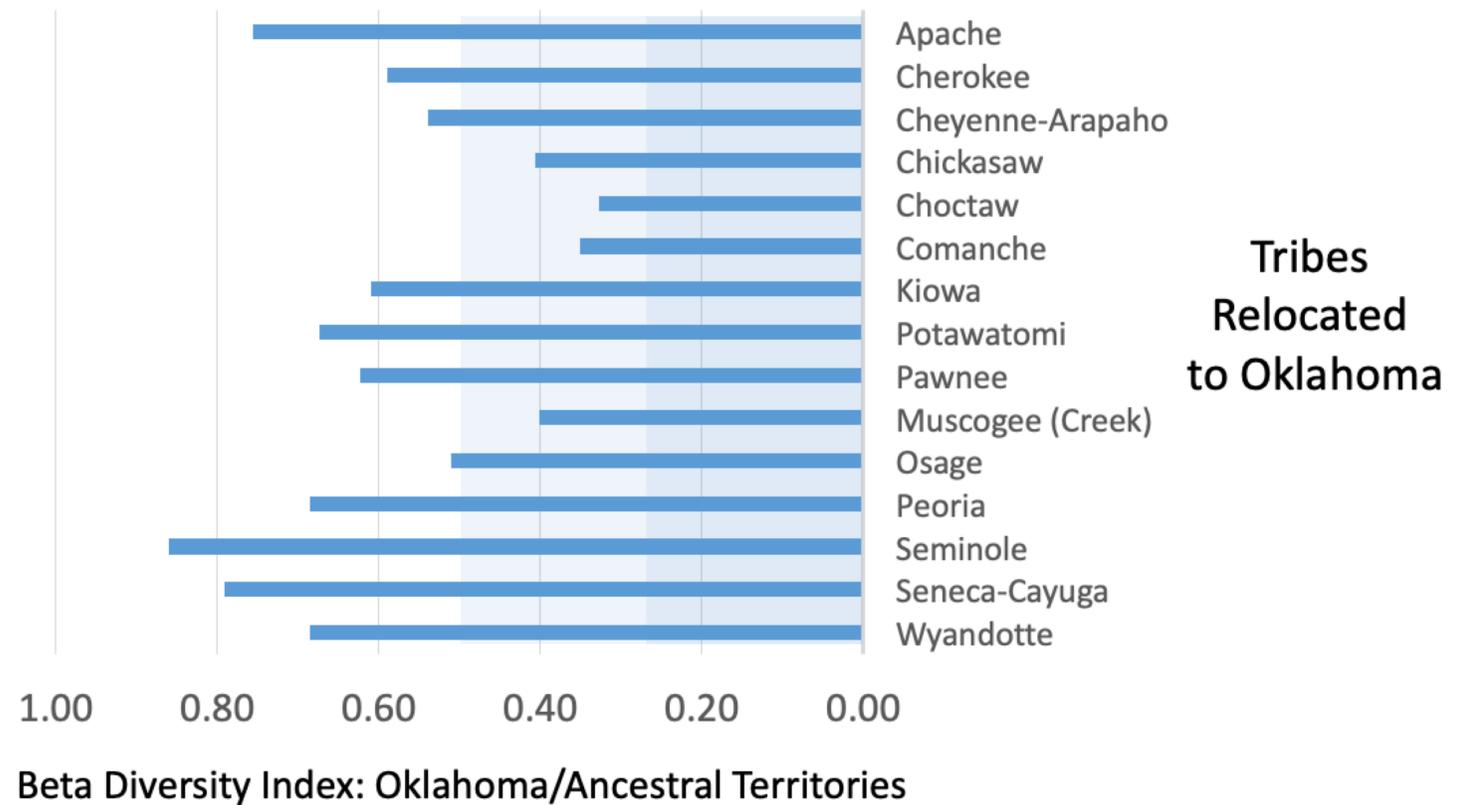


Fig. 1. The shifted baseline of biodiversity appreciation. From their original territory western New York, Cayuga and Seneca people would have been very familiar with the distinctive drumming of the Yellow-bellied Sapsucker during summer. Sapsuckers winter, but do not breed, near the current Seneca-Cayuga territory near the city of Grove, Oklahoma so this sound is not heard during summer and an important cultural connection to native biodiversity has been severed. (Andy Reago and Chrissy McClarren photo.)

## Beta Diversity Illustrates the Shifted Baseline of Breeding Birds for Relocated Tribes



## Methods

- data from eBird for breeding seasons 2009–2018
- compared species composition of ancestral lands to Oklahoma jurisdictions for fifteen tribes
- calculated pairwise beta diversity to quantify difference in bird species composition between ancestral and Oklahoma lands

## Results and Discussion

- Beta diversity quantified the perceived loss of biodiversity as a cultural ecosystem service.
- Eleven of 15 relocated tribes occur in areas of Oklahoma that support breeding bird communities >50% dissimilar to bird communities in the ancestral lands of the tribe.
- Change in bird communities is only one aspect of the many changes tribes would have had to endure upon their forced relocation to Oklahoma.