

DATA *Nugget*

Bye Bye Birdie? Part I

Featured scientist: Richard Holmes from the Hubbard Brook Experimental Forest

Research Background:

The Hubbard Brook Experimental Forest is a forest where scientists have collected ecological data for many years. It is located in the White Mountains of New Hampshire. The data from this forest experiment help uncover trends that happen over long periods of time. It is important to collect data on ecosystems over time, because these patterns would be missed with shorter experiments.

Avian ecologists (scientists who study the ecology of birds) have been recording which bird species live at the experimental forest for over 40 years. The data collected during this time is one of the longest bird studies ever conducted! Richard is an avian ecologist who began this study because he was interested in how bird populations were responding to long-term environmental change. Every summer since 1969, Richard takes his team of scientists, students, and technicians out into the field to see how the birds are doing.

Richard's team monitors populations of over 30 different bird species. This involves waking up every morning before the sun comes up and traveling to the far reaches of the forest. They listen for, look for, identify, and count all the different birds seen in each area. These ecologists recorded the numbers of birds observed per 10 hectares,



Male Black-throated Blue Warbler feeding nestlings. Nests of this species are built typically less than one meter above ground in a shrub such as hobblebush. Photo by N. Rodenhouse.

roughly the same size as 19 football fields! The data collection points are arranged in transects that run north/south along the valley. Each transect is approximately 500m apart from the next transect. At each point, the observer stands for ten minutes recording all birds seen or heard in a ten minute interval, and estimates the distance the bird is from the observer. The entire valley is covered 3 times a season. By looking at bird abundance data, scientists can identify population trends among birds to see how they change over time.

Scientific Question: How has the total number of birds at the Hubbard Brook Experimental Forest changed over time?

Scientific Data:

Use the data below to answer the scientific question

Year	Total number of birds counted (#/10 hectares)
1969	158
1970	163
1971	212
1972	214
1973	192
1974	161
1975	201
1976	194
1977	187
1978	149
1979	147
1980	131
1981	117
1982	124
1983	118
1984	89
1985	116
1986	91
1987	85
1988	113
1989	101
1990	133
1991	120
1992	130

Year	Total number of birds counted (#/10 hectares)
1993	94
1994	84
1995	72
1996	93
1997	87
1998	72
1999	85
2000	89
2001	91
2002	71
2003	89
2004	76
2005	96
2006	108
2007	100
2008	92
2009	106
2010	108
2011	95
2012	105
2013	120
2014	113
2015	114

What data will you graph to answer the question?

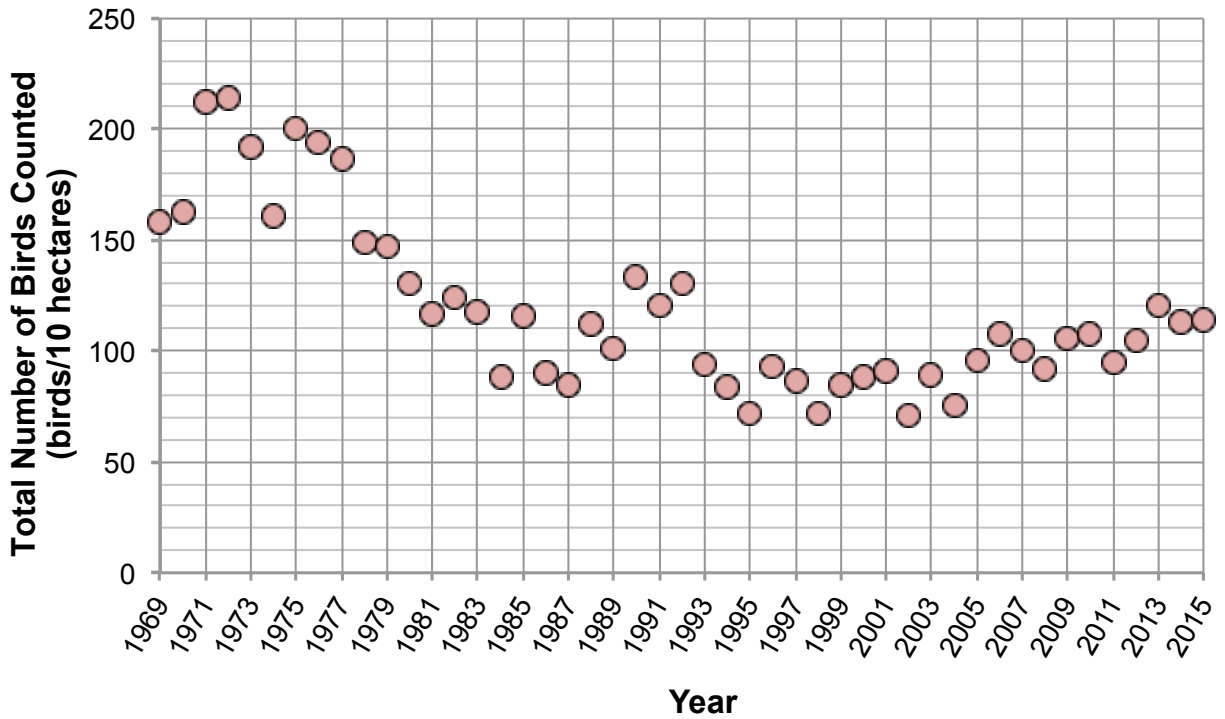
Independent variable: _____

Dependent variable: _____



View of the Hubbard Brook Experimental Forest

Below is a graph of the data:



Interpret the data:

What trends, changes, or differences do you see in the table or on the graph?

What is the relationship between the dependent and independent variables? What does the relationship between the variables mean?

Make a claim that answers the scientific question.

Support your claim using data as evidence. Reference specific parts of the table or graph.

Explain your reasoning and how the data supports your claim.