National *fish, wildlife & plants* CLIMATE ADAPTATION STRATEGY

Project Title: Projecting Future Effects of Land Management, Natural Disturbance, and CO2 on Woody Encroachment in the Northern Great Plains in a Changing Climate

Headline Title (2-5 words): Effects of Climate Change on Woody Encroachment

Brief Summary (Abstract): This project is examining the effects of climate change on woody encroachment to guide management practices.

Project Location: Northern Great Plains (Parts of Montana, North Dakota, South Dakota, Wyoming, Nebraska)

Partners: Researchers from the U.S. Geological Survey Northern Prairie Wildlife Research Center, the Conservation Biology Institute, and Oregon State University.

Background: Maintaining the native prairie lands of the Northern Great Plains (NGP), which provide an important habitat for declining grassland species, requires anticipating the effects of increasing atmospheric carbon dioxide (CO_2) concentrations and climate change on the region's vegetation. Specifically, climate change threatens NGP grasslands by increasing the potential encroachment of native woody species into areas where they were previously only present in minor numbers.

Project Goals: Researchers are using a dynamic vegetation model to simulate vegetation type (grassland, shrubland, woodland, and forest) for the NGP for a range of projected future climates and relevant management scenarios. Comparing results of these simulations will illustrate the sensitivity of woody encroachment projections to climate change factors. Improved understanding of the effects of increasing CO_2, climate change, and land management practices on potential woody encroachment will be used to guide management practices to be most effective in protecting grassland habitat in the NGP into the future.

Strategy Goals Implemented: Goal 5, Strategy 5.3, Action 5.3.4.: Develop and use models of climate-impacted physical and biological variables and ecological processes at temporal and spatial scales relevant for conservation.

Goal 5, Strategy 5.3, Action 5.3.2: Improve modeling of climate change impacts on vulnerable species, including projected future distributions and the probability of persistence.