

BLUEBIRD STUDY AT MURDERERS CREEK WILDLIFE MANAGEMENT AREA
1990-1991 REPORT
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INTRODUCTION

The bluebird project at the Murderers Creek Wildlife Management Area (MC WMA) is part of a long-term study of Western Bluebirds (*Sialia mexicana*) and Mountain Bluebirds (*Sialia currucoides*) in central Oregon. The study is being conducted by the Northwest Ecological Research Institute (NERI), a non-profit organization based in Portland. The objectives of the study are: 1. to investigate the effects of chemical grasshopper control on the reproductive success of bluebirds, and 2. to examine the potential for reducing grasshopper densities by increasing bluebird numbers. The study was initiated in 1988 and will continue until spraying occurs and can be studied. The project has been funded by the U. S. Fish and Wildlife Service in 1988, the APHIS Integrated Pest Management Program through contracts with the Fishery and Wildlife Biology Department of Colorado State University in 1989 and 1990, and grants from the North American Bluebird Society.

STUDY AREAS AND METHODS

Most of the bluebird study has been carried out in the area around Fossil in Wheeler County. Eight study sites were established there in 1988, with about 35 wooden nest boxes being placed on juniper trees or fence posts at each site. Then it was felt that additional sites were necessary at a considerable distance from Fossil, in order to ensure that not all sites would be included in a spray program, so that comparison of sprayed and non-sprayed sites could be made. In the fall of 1989, 2 adjacent sites were established at MC WMA (Figure 1). A total of 70 nest boxes were placed either on juniper trees from which some of the branches had been removed on one side, or on poles set in rock jacks constructed for the study by a school group volunteer project. Inside dimensions of the boxes are 4 X 5 X 11 inches, with an entrance hole 1 9/16 inches in diameter.

In addition to the study sites, several similar sites with no boxes have been established in both Wheeler and Grant Counties. The purpose of these sites is for comparison in determining the responses of both bluebird and grasshopper numbers to the placing of nest boxes.

During each breeding season, teams of NERI associates and volunteers visit the sites every 2 weeks from May through July or early August. At each visit, every box is checked, although time and funding limitations have caused us to abandon the least productive study sites near Fossil. Data collected from the box checking includes the species nesting, number of eggs or number and development stage of nestlings, any signs of predation on failed nests, and whether nests successfully fledged. Boxes are cleaned out after nests have fledged or failed, unless a subsequent nest has been initiated. A final visit is made in October, at which time all boxes are cleaned out and repaired as necessary.

Visual diet samples are taken at some of the nests with nestlings, by observing with 10X binoculars to identify items delivered to the nestlings by the parents (or fledglings from a first brood). Other diet samples are recorded when cleaning fledged nests where uneaten food items are occasionally left.

Many of the nestlings are banded with a USFWS numbered leg band and a colored plastic leg band.

On one visit in June and one in July, a bluebird census is taken on each study site and each no-box site. At these times, counts of grasshoppers are made at several points on each site.

RESULTS

In 1990, 9 (13%) of the 70 boxes at MC WMA were occupied by bluebirds (not including nests that did not receive any eggs, since these may be alternate nests for pairs that lay eggs elsewhere). Of these 9, 5 were Western Bluebird, one was Mountain Bluebird, and 3 were unknown bluebird. Tree Swallows occupied one box. In 1991, 26 (37%) of the 70 boxes were occupied by bluebirds. Of these, 15 were Western Bluebird, 6 were Mountain Bluebird, and 5 were unknown bluebird. Tree Swallows occupied 2 boxes. This box occupancy rate and increase is comparable to that at the sites near Fossil.

The mean number of eggs per full clutch was slightly higher for Western than Mountain Bluebirds in each year and in both areas, and was significantly higher in 1990 than in 1991 for both species in both areas (5.36 in 1990, 4.85 in 1991 overall). The percentage of nests that successfully fledged at least one nestling has been higher at MC WMA than at the Fossil sites in both years studied, although at both areas the success rate was considerably higher in 1990 than in 1991 (53% in 1990, 45% in 1991 overall). Differences between the 2 years are considered to have been related to the colder, wetter spring weather in 1991. There have been fewer second nests at MC WMA than at the Fossil sites, and the entire nesting season has ended several weeks earlier both years.

Grasshoppers were very late hatching in 1991 throughout eastern Oregon. They were less numerous on the MC WMA in 1991 than in 1990, even in July, but equally numerous in July in the 2 years at the Fossil sites. Grasshoppers appeared to be less numerous, and bluebirds were definitely more numerous, on sites with nest boxes than on no-box sites, except for one site with boxes and high numbers of bluebirds, which also had high grasshopper numbers. Although few diet samples were obtained at MC WMA in 1990, all the data from both years and both areas indicates that grasshoppers and crickets are important in the diet of nestlings of all bluebirds, but that spiders, beetles, caterpillars and moths, ants, and other insects are also utilized. At MC WMA, in 1990 grasshoppers and crickets made up 96% of the few diet samples taken, but in 1991 they made up 41%. At Fossil, in 1990 grasshoppers and crickets made up 77% of the diet samples taken, but in 1991 they made up 45%.

DISCUSSION

Chemical spraying has not occurred since the study started. Four years of monitoring nests at the Fossil sites, and 2 years at the MC WMA sites have provided abundant baseline data, during a

variety of weather years. At this time it appears very likely that spraying will occur at a site other than where we have boxes. With sufficient lead time, we can put up 20 boxes where spraying is planned, and if even 3 or 4 bluebird pairs nest, we can compare the results to our baseline data from both the Fossil area and the MC WMA. While our initial hope was that conditions at MC WMA would be very similar to that at Fossil, so that data from all sites could be pooled, now it appears that it may be most useful that the sites are slightly different, so that we can compare data from the area of a spray program to a broader range of data and conditions.

At this time it appears that the mild winter and dry conditions may favor high densities of grasshoppers in eastern Oregon in 1992. The Oregon Department of Agriculture received several inquiries about spraying, and there is a high likelihood of spraying in the state in 1992 or 1993. With the continued excellent cooperation from the Oregon Department of Agriculture, the Oregon Department of Fish and Wildlife, and private landowners, as well as from the bluebirds, we feel that we are in a good position to complete our study in the next 2 years. The nest boxes at MC WMA will of course be left in place after the study, and we would hope to monitor and maintain them at least annually after the study is completed.

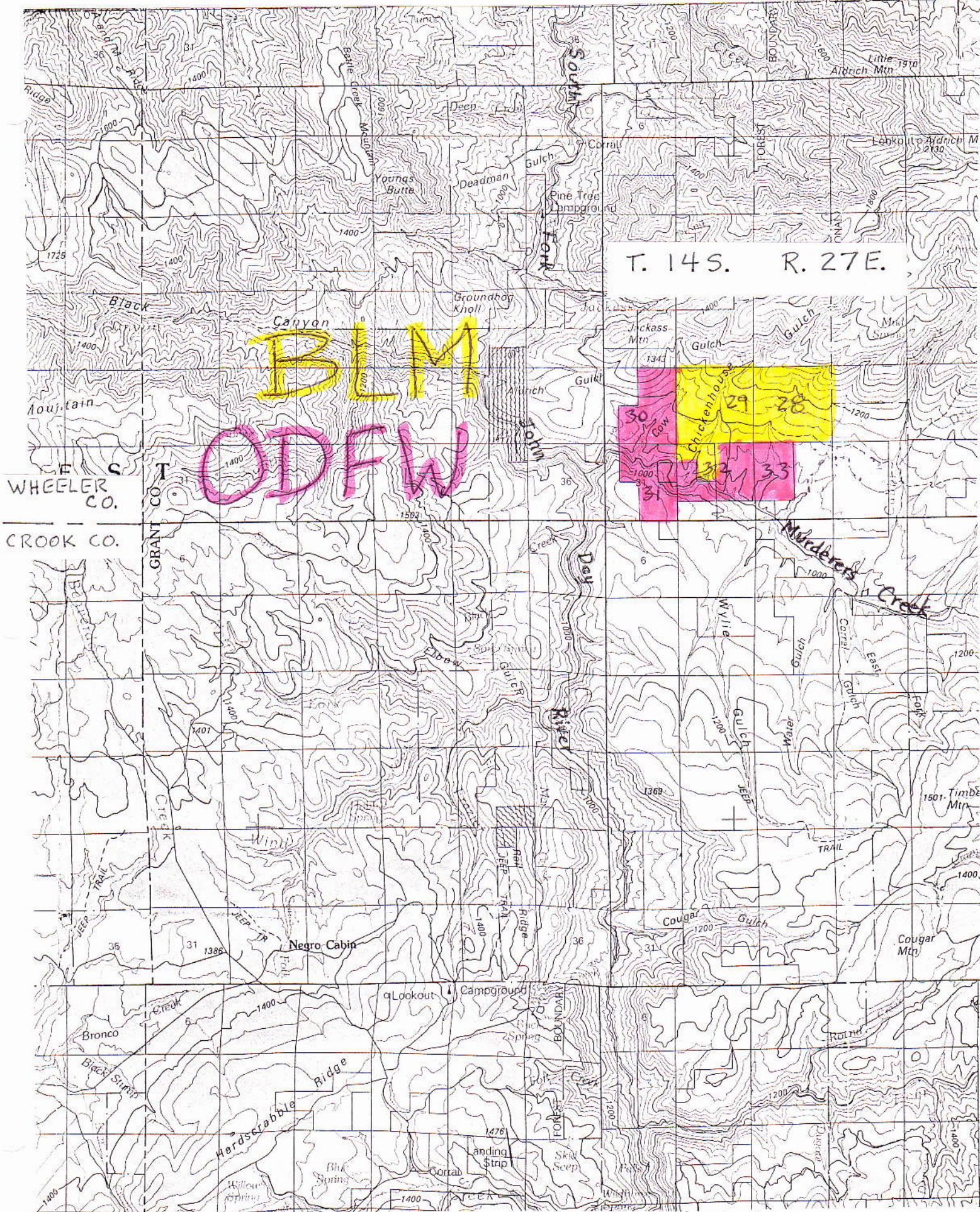


FIGURE 1.