



Summarizing the Number of Lynx Located South of Highway 160

Addendum to the Report “*Lynx (Lynx canadensis)* Use of the Wolf Creek Pass Area along Highway 160, Mineral County, Southwestern Colorado” for:

The Colorado Division of Wildlife

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INTRODUCTION

This addendum to the Report for the Colorado Division of Wildlife entitled “Lynx (*Lynx canadensis*) use of the Wolf Creek Pass area along Highway 160, Mineral County, southwestern Colorado” prepared by Tanya Shenk (hereafter referred to as the LUWCP Report, dated February 2005) was prepared in response to requests to clarify the number of lynx located south of Highway 160. The confusion stems from different summaries that have been provided by different analysts using different data sets and different analysis areas. This addendum provides the total number of lynx located south of Highway 160 using three different analysis areas (Figure 1) and three different data sets (Table 1).

ANALYSIS AREAS

Three analysis areas were used to summarize number of lynx located south of Highway 160. They include:

1. The area demarcated in maps presented in a preliminary memo prepared by Tanya Shenk and sent to interested parties concerning lynx use of the Wolf Creek Pass area. In that preliminary memo dated July 8, 2004, the number of individual lynx located south of Highway 160 was not tallied or reported. Rick Thompson (of Western Ecosystems, Inc) tallied the number of individual lynx labeled on the maps by hand using the maps provided in the preliminary memo. This area is labeled as Area A on Figure 1.
2. The area used in the LUWCP Report was defined as the nearest area of repeated use by multiple lynx north and south of Highway 160, the proposed development area and the stretch of Highway 160 between Pagosa Springs and the Colorado 149 junction. The area where lynx were counted was bounded by Highway 160 between Pagosa Springs and Alamosa, with a western boundary of Highway 84 south of Pagosa Springs, an eastern boundary of Highway 17 south of Alamosa and a southern boundary of the Colorado state line. This analysis area encompasses all of the area in analysis area A and is labeled as Area B in Figure 1.
3. The area used in the LUWCP Report with the west and east boundaries extended into New Mexico to encompass all known lynx locations. This analysis area includes all the area encompassed by analysis area A and B and is labeled as Area C in Figure 1.

METHODS

Data Sets

Two types of lynx location data were used for these analyses. The first type of lynx location data are collected via satellite from the satellite transmitters on the lynx (hereafter satellite locations). Satellite transmitters were first used for lynx in April 2000 in combination with the VHF transmitters. The satellite transmitters are designed to

provide locations on a weekly basis for 18 months. The second dataset of lynx locations includes all aerial locations obtained from daytime flights conducted to locate lynx by their VHF transmitters (hereafter aerial locations). VHF transmitters have been used on lynx since the first lynx were released in February 1999.

For the LUWCP Report, we assumed that lynx may not be exhibiting typical habitat selection behavior within the first few months after their release in Colorado. Therefore, the first six months of locations after release for each lynx were excluded from both the aerial and satellite location datasets. The preliminary memo included all locations of lynx obtained from the date of first release and were used in the data analysis conducted by Rick Thompson (Western Ecosystems Inc, dated January 26, 2005).

Therefore, the three different data sets used in the summaries provided in this addendum are:

1. All known lynx locations obtained either from VHF aerial locations or satellite locations from the date of the first lynx release on February 3, 1999 through April 2004 that were labeled with individual lynx ID's on maps made available through a preliminary memo (dated July 8, 2004) on lynx use of the Wolf Creek Pass area.
2. All known lynx locations obtained either from VHF aerial locations or satellite locations from the date of the first lynx release on February 3, 1999 through April 2004 as determined through a complete database identification of each lynx location by individual identification.
3. All known lynx locations obtained after the first six months post-release from VHF aerial locations or satellite locations As a result, the aerial location dataset used for this analysis contains lynx locations from September 1999 through April 2004 while the satellite location dataset begins in October 2000 and also extends through April 2004.

Accuracy of both aerial and satellite locations vary with the environmental conditions at the time the location is obtained. Satellite location accuracy is also influenced by atmospheric conditions and position of the satellites. Satellite location accuracy can range from 150 meters -10 km. Accuracy of aerial locations is influenced by weather with accuracy ranging from 50 - 500 meters.

Summaries of Area Use

All lynx were released into Colorado north of Highway 160. Therefore, to estimate the number of lynx that most likely crossed Highway 160 near the proposed development, the number of lynx located at least once south of Highway 160 were counted. Analyst Rick Thompson (Western Ecosystems, Inc.) only had maps with locations of individual lynx on them to use when he counted number of individuals located south of Highway 160. Due to heavy overlap of some location points, not all points were labeled with individual lynx ID. All the summaries presented in this addendum by analyst Tanya Shenk (CDOW) were compiled by knowing the identification of each lynx associated

with each location point. Number of lynx known to be south of Highway 160 were therefore compiled for three different analysis areas by using three different data sets.

RESULTS

Number of lynx known to be south of Highway 160 as compiled by either Rick Thompson (Western Ecosystems Inc.) or Tanya Shenk (CDOW) in three different analysis areas (Figure 1) are presented in Table 1.

Table 1. Total number of individual lynx located in each of three analysis areas south of Highway 160, using three different data sets and two different analysts.

Data Set	Analysis Area ID	Data Analyst	Number of Lynx Within the Analysis Area
All lynx locations identified by point labels	A	Rick Thompson	54
All lynx locations	A	Tanya Shenk	63
All lynx locations	B	Tanya Shenk	80
All lynx locations	C	Tanya Shenk	81
All lynx locations 6-months post release	A	Tanya Shenk	20
All lynx locations 6-months post release	B	Tanya Shenk	27
All lynx locations 6-months post release	C	Tanya Shenk	29

DISCUSSION

Each of the reported number of lynx located south of Highway 160 is correct, based on the data available to the analyst and the analysis area considered. These summaries are representative of the minimum number of lynx located south of Highway 160 as there are reintroduced lynx that have lost their collars or have collars that no longer function. In addition, there are now Colorado-born kittens independent and alive without radio collars.

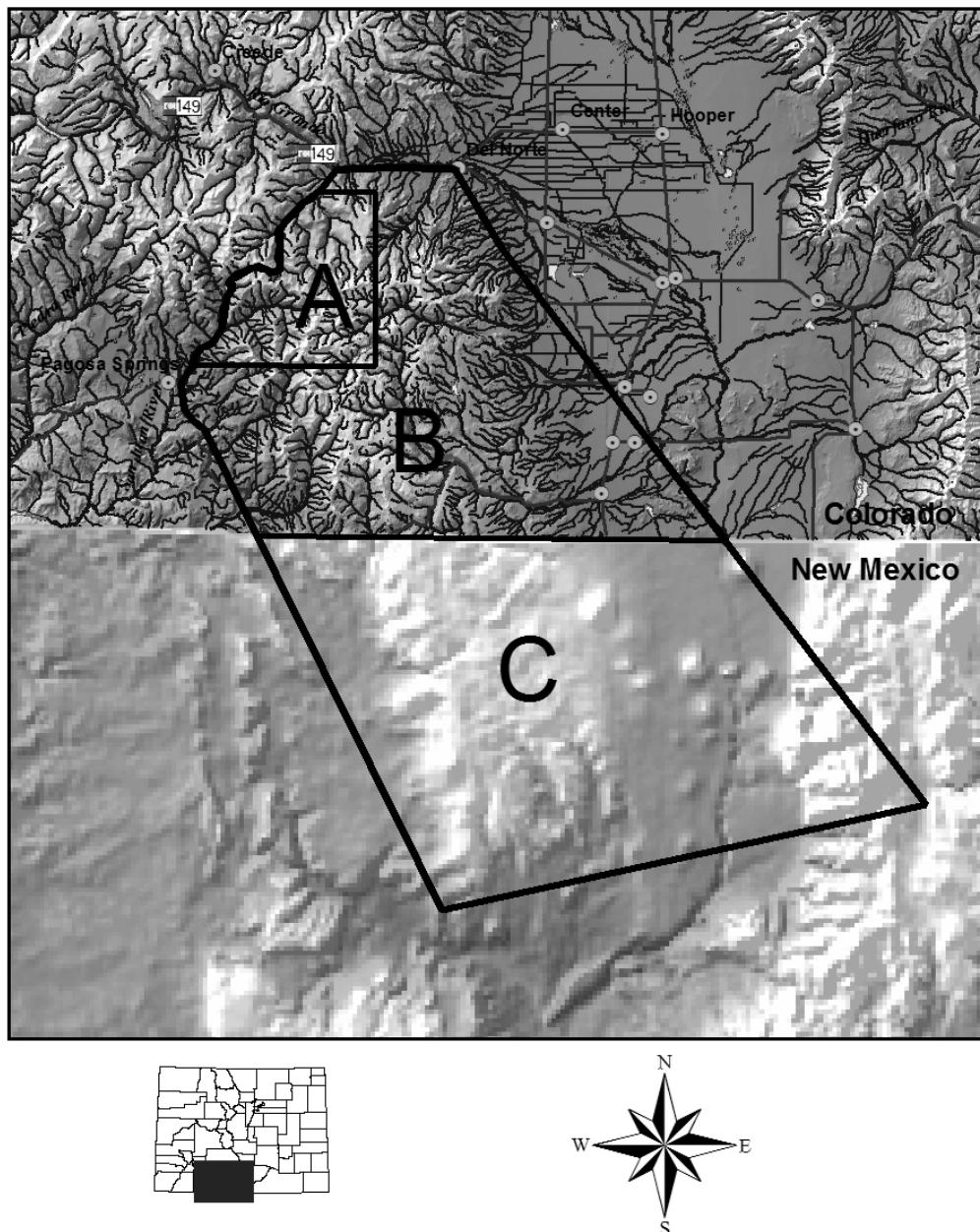


Figure 1: Analysis area boundaries for summarizing number of lynx located south of Highway 160.