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REPOPULATION STUDIES OF VAMPIRES IN CAVES

English copy of paper given at the 7th Annual Reunion of the INSTITUTO NACIONAL DE INVESTIGACIONES PECUARIAS during the 14th, 15th and 16th of January 1970.

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I. Introduction:

This study was undertaken to determine how fast a colony of vampires returned to its original number after a large population reduction. This information should give indications of how often control programs need to be repeated, once they have been initiated.

II. Methods and Study Areas:

Seven vampire roosts in caves and abandoned mines in three different physiographic regions of Mexico have been studied, for varying length of time. In each case the vampire population was estimated, a reduction carried out, and later other population estimates were made. Temperature and humidity were taken under the principle roost site, and at the mouth of the cave or mine in the shade at the time that the second population estimate was made. Thereafter the cave was visited at 4 week intervals for the first few months, but this time was

extended to 8 week intervals if the population was recovering very slowly. Each time a roost was visited, the population was estimated and the temperature and humidity were taken at the previously mentioned locations.

Two roosts were located in caves on the coastal plane near Tuxpan, Veracruz, at about 20 meters above sea level. The area is humid, without a well defined dry season. The temperature is hot with no well defined cold period. Livestock density for the state is about 115 head/100 hectares of pasture, and 40-50% of state is in pasture.

Two roosts were located in abandoned mines in the mountains south of Oaxaca, Oaxaca, at 950 and 1090 meters above sea level. The area is semi-arid with a dry winter period. It has moderate temperatures without a well defined cold season. Livestock density for the state is about 95 head/100 hectares of pasture, and 20-30% of the state is in pasture.

The three remaining roosts were in caves located in draws near Cuernavaca, Morelos, at about 1,500 meters above sea level. The area is humid to semi-arid with a well defined dry season. It has moderate temperatures with no well defined cold period, but is the coolest of the three areas studied. Livestock density for the state is about 290 head/100 hectares of pasture and 20-30% of the state is in pasture. (All climatic

and livestock data from Tamayo, 1962).

### III. Results:

On the first visit to caves near Tuxpan on September 8-12, 1969, the total population of the caves was estimated at 85-110 vampires. During two nights of intensive trapping 140 vampires were taken from the caves, and the remaining population of vampires was estimated at 50-70. This indicates there was rapid immigration into the caves.

The second visit was made on October 13, 1969, and the population was estimated at 105-135. Showing that in one month or less the population increased from 50-70 to 105-135 vampires, and passed the original estimate of 85-110 made a month earlier.

Such an increase could only come from rapid repopulation by immigration into the caves. Temperature and humidity in the caves was 76°F and 91-96% respectively. There was no evidence of human disturbance to the vampire population between our visits.

Two trips have been made to the mines near Oaxaca for the repopulation study. However, we have data on the mine "Tiro de la mina del Aire" from previous visits by Dr. William A. Wimsatt. The mine "Tiro de la Mina del Aire" was visited by Dr. Wimsatt on May 15, 1969. He removed 30-51 vampires and left an

estimated 6 in the tunnel. The entrance was covered and no vampires escaped, hence, the population on that date was about 60. We visited the mine on November 6 and December 4, 1969, and estimated the vampire population at 20-30 and 17-20 animals respectively. Thus the mine showed an increase of from about 6 to about 20 vampires over a period of about 5 months. There was no evidence of disturbance to the mine between our visits. Temperature under the principle roost varied from 79-81°F and humidity, taken only on our first visit was 51%.

The mine "Veta Nueva" was visited for the first time for the repopulation study on November 5, 1969, the population was estimated at 145-150 vampires, and 103 vampires were removed that day. On November 7 the population was estimated at about 40 vampires. On December 4, 1969 the cave was again visited, and the population was estimated at about 60 vampires or an increase of about 20 individuals in about a month. The temperature and humidity under the principle roost varied from 73-74°F and from 54-65% respectively. There was no evidence of human disturbance between the visits to the cave.

Three caves, "8 de Julio", "Palmira III", and "Del Río Palmira", in the Cuernavaca region were visited for the

repopulation studies ten times between January 23, and November 27, 1969. The populations in all three caves had been reduced during several visits over a period of about 6 months, so when this study was initiated vampire populations in the caves were already very low. The vampire populations varied with the cave, and in general, fluctuated at a low level, never coming near the original populations. The population fluctuations appeared to be closely related to seasonal changes in temperature and humidity in the area. Populations declined drastically during the winter months when nights were cold.

#### IV. Discussion:

The caves near Tuxpan were fully repopulated in one month or less, while this did not occur in the roosts near Oaxaca nor Cuernavaca. A possible explanation for this rapid repopulation at Tuxpan follows. Some type of social organization among the vampires, interacting with micro climate requirements of a roost probably limit the number of vampires in any roost at any one time. When the residents of a particular roost are removed, vampires from the surrounding area quickly move into the vacancy. These vampires may move in from less favorable roosts, or they may come merely on an opportunistic basis as

Villa-R (1966) and Wimsatt (1969) have suggested.

Why this phenomenon did not occur at roost sites near Oaxaca and Cuernavaca can probably be explained on the basis of climatic and vegetative differences, since food supply seems not to be a limiting factor in any of the areas. In general, vampires near Tuxpan could probably survive year round in types of roosts in which they could not survive year round, or which were not available near Oaxaca or Cuernavaca. In the Oaxaca study area dry winters and lack of roosts sites in trees, and in the Cuernavaca study area cool winter temperatures could hold vampire populations down.

In these dryer and cooler areas, vampires may survive year round in only the most favorable roosts, such as caves. Hence, when their numbers are drastically reduced there are fewer animals available to move into the vacancy created.

Finally, the winter decline in vampire populations in caves near Cuernavaca indicate a seasonal related mortality or a partial migration.

Hence, there appears to be different repopulation rates of vampires in different physiographic regions of Mexico and planning for control programs should take this into consideration.

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