A COLLAR FOR ATTACHING RADIO TRANSMITTER TO NUTRIA[a]

PAUL D. COREIL, Louisiana Cooperative Wildlife Research Unit, Louisiana State University, Baton Rouge, LA 70803

H. RANDOLPH PERRY, JR., Louisiana Cooperative Wildlife Research Unit, Louisiana State University, Baton Rouge, LA 70803

Abstract: Several collar materials (nylon webbing, nylon-covered rubber tubing, nylon webbing lined with nutria fur, boltaron hard plastic, latex tubing, and a nylon harness) and 2 transmitter weights (60 and 120 g) were comparatively tested for potential use as radio transmitter units for nutria (*Myocastor coypus*). Most collar materials caused dermatitis, abrasions, or lesion around the neck and the animals continuously worked their way out of the nylon harness. The only combination which did not cause any adverse physiological reaction was the nylon-covered rubber tubing collar with a 60 g dummy transmitter. The tubing collars were attached with a tightness approximately 14% greater than neck circumference; this expansion allowed normal feeding and grooming yet prevented the animals from getting their front paws caught between the collar and neck.

Proc. Annual Conf. S.E. Assoc. Fish & Wildlife Agencies 31:254-258

The nutria has become a major furbearer in Louisiana and several other areas of the United States (Wilson 1968; Evans et al. 1972; Lowery 1974; O'Neil and Linscombe 1975). International interest in the nutria has also greatly increased as a result of the demand for dense-haired furs. Knowledge is still lacking, however, on nutria habitat preferences, long range and daily movements, and activities.

Radio telemetry has been proven one of the most accurate means of recording habitat, activity, and movement data for many wildlife species (Marshall et al. 1962; Cochran and Lord 1963; Ellis 1964; Mech et al. 1965). However, nutria radio-tracking studies have been seriously hindered in Louisiana, where the nutria is an 8 million dollar fur resource (O'Neil and Linscombe 1975), because of severe physiological resistance of nutria to transmitter attachment collars. Evans et al. (1972) found nutria to exhibit a physiological resistance to almost all types of foreign material inserted or applied to the body (such resistance may cause atypical behavior). They concluded that unless a collar material that does not cause adverse physiological resistance is developed, long-term telemetry studies would not be possible.

The objective of our study was to investigate the physiological response of nutria to several collar material–transmitter weight combinaions. Results of the study will be uilized to design a suitable transmitter package for long-term nutria field studies in Louisiana. We gratefully acknowledge the assistance of J. D. Newsom, Leader, Louisiana Cooperative Wildlife Research Unit and K. L. Koonce and H. S. Gosser, Louisiana State University, Departments of Experimental Statistics and Veterinary Pathology, respectively, for assistance in project design, logistics, and data evaluation. R. G. Linscombe also contributed to project design. This study was funded by the Louisiana Department of Wildlife and Fisheries.

METHODS AND MATERIALS

In the first phase of study 30 adult female nutria were captured from 2 locations in Louisiana, Rockefeller Refuge in Cameron Parish and Marsh Island Refuge in Iberia Parish. In the second phase of study all 12 adult male nutria were live-trapped on Marsh Island Refuge. Standard double door live-traps (Tomahawk 206) were used in all trapping operations. Only apparently healthy nutria were utilized in the study.

To facilitate collar evaluation a pen was constructed on the Ben Hur Experimental Farm of Louisiana State University. Pen construction and nutria rearing suggestions were taken from Hodgson (1949) and Kinsel (1958). Nutria were allowed a 2-3 wk period of acclimation before being collared.

The 30 adult female nutria were divided into 3 blocks (groups separated according to weight) with each block containing 10 animals. One animal from each block was then randomly assigned to each of 9 treatment combinations. Four collar materials (26 mm wide nylon webbing, nylon-covered 10 mm diameter rubber tubing, nylon webbing lined with nutria fur, and 18 mm wide boltaron hard plastic; Wildlife Materials, Inc., Carbondale, IL) (Fig. 1) were investigated with 2 different dummy transmitter weights (approxi-

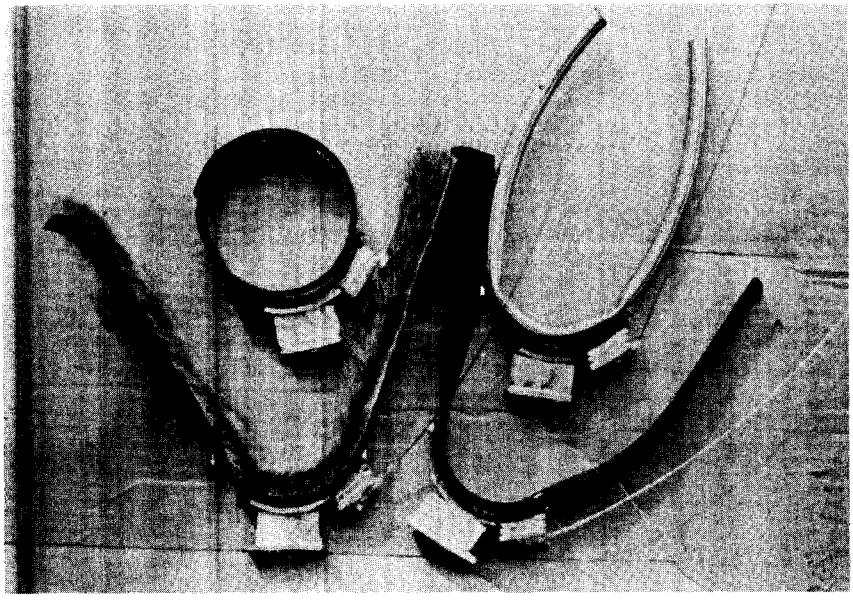

Fig. 1. Collar materials of boltaron hard plastic, nylon-covered rubber tubing, nylon webbing lined with nutria fur, and nylon webbing (left to right, top to bottom) which were evaluated as potential carriers of radio transmitters for nutria.

mately 60 and 120 g) to form 8 of the treatment combinations. The control group made up the final treatment and contained 6 animals. The 30 animals were collared on 8 February 1977.

The 12 adult male nutria were randomly assigned to 4 collar-transmitter weight treatment combinations: a 6 mm diameter latex tubing collar and a 26 mm wide nylon harness with 60 and 120 g dummy transmitters (Fig. 2). The 6 animals on each of the

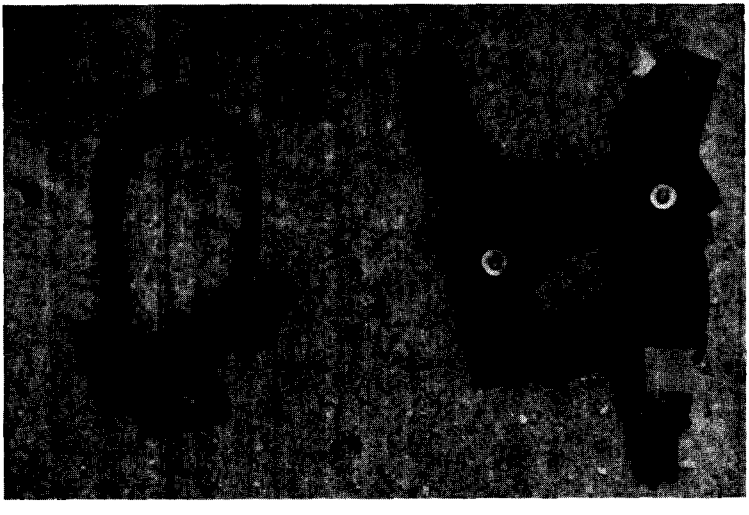

Fig. 2. Latex collar and harness of nylon webbing which were evaluated as potential carriers of radio transmitters for nutria.

latex tubing and nylon harness treatment combinations were collared on 22 and 29 March 1977, respectively. Pen studies were completed on 12 April 1977.

Dummy transmitters were attached to the collars and around the neck of the animals by tying for the 2 latex tubing treatment combinaions. Attachments were made using pop-rivets in all other collar-transmitter combinations.

Nutria weights and rectal temperatures were taken weekly to help evaluate physiological response over time. Gross external physiological reactions to the collars were evaluated through weekly visual observations and physical examinations; blood samples were taken on 3 occasions for treatment-control comparisons of basic parameters. To enable easier handling, ketamine hydrochloride was used as a tranquilizer.

RESULTS AND DISCUSSION

Through weekly physical examinations most of the collar-transmitter combinations investigated during the first phase of the study were eliminated as potential radio transmitter packages. Abrasions or lesions formed on all collared animals except those having the 60 g dummy transmitter-nylon coated rubber tubing collar combination (Fig. 3,

Fig. 3. Typical abrasions and lesions formed around the necks of most all nutria collared with materials other than the nlyon-covered rubber tubing with a 60 g dummy transmitter.

Table 1). These 3 animals showed no signs of physiological resistance and appeared to adapt well in grooming and feeding activities. The 3 animals carrying the 60 g tubing collars were evaluated for approximately 8.5 weeks without any apparent adverse physiological response. The collars of all animals which developed physiological resistance (dermatitis, lesions, abrasions) were immediately removed.

Collar tightness seemed to play an important role in determining the occurrence of any adverse reactions. We were able to attach the 60 g tubing collars with a length approximately 14 percent greater than the neck circumference of the animal. This degree of tightness held friction to a minimum, allowed unhampered grooming activities, and provided enough snugness to prevent the front paws from getting caught between the collar and the neck. When all other collar materials were attached with the 14 percent expansion factor, front paws were frequently caught between the collar and neck. Subsequent collar tightening increased friction around the neck, hampered grooming activities, and thus resulted in abrasion and lesion formation.

Table 1. Time periods after initial attachment of dummy transmitter units that first signs of abrasions or lesions were observed in penned nutria, Ben Hur Experimental Farm, 1977.

Treatment combination	*Animal number*	*Time period (days)/Remarks*
Webbing	32	9
(120 g)	25	escaped
	37	9
Webbing	24	9
(60 g)	26	21
	6	9
Fur	7	13
(120 g)	14	21
	29	21
Fur	5	14
(60 g)	27	24
	8	14
Plastic	21	17
(120 g)	31	17
	30	17
Plastic	17	17
(60 g)	4	17
	3	17
Tubing	9	no abrasions or lesions observed
(120 g)	19	9
	36	21
	12	no abrasions or lesions observed
Tubing	23	no abrasions or lesions observed
(60 g)	34	no abrasions or lesions observed
Latex	46	7
(120 g)	47	7
	45	7
Latex	49	11
(60 g)	44	7
	40	7
Harness	39	animal pulled out of harness
(120 g)	48	animal pulled out of harness
	42	animal pulled out of harness
Harness	43	animal pulled out of harness
(60 g)	38	animal pulled out of harness
	41	animal pulled out of harness

One animal with the 120 g dummy transmitter on the nylon-coated rubber tubing collar also showed no signs of physiological resistance. The 2 other animals on this treatment, however, did show an adverse reaction which apparently was related to dummy transmitter weight.

The 2 collar materials tested during the second phase of the study were found unusable. The latex collars seemed to cause adverse physiological reactions regardless of dummy transmitter weight (Table 1). Several of the animals also easily removed the latex collar because of its high stretchability. This made it necessary to increase collar

tightness which subsequently increased the pressure around the neck area and caused abrasions or lesions. The nylon harnesses were found unfeasible mainly because the animals continuously worked their way out of the harnesses either partially or completely. When tightened the harnesses seemed to hinder walking to a great extent and were therefore removed.

Weight, rectal temperature, and the limited blood parameter data obtained were of little value in evaluating physiological response bacuse of sampling variability and lack of baseline information. However, the only collar-transmitter combination which did not cause any obvious adverse physiological reaction was the nylon-coated rubber tubing collar with the 60 g dummy transmitter. In any future nutria telemetry studies, these restrictions should be seriously considered to help ensure data are not gathered from animals which may be exhibiting abnormal behavior caused by physiological response to transmitter attachment.

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