A Survey for *Nicrophorous americanus*, Olivier "American Burying Beetle" on Sandbars and Islands in the Missouri National Recreational River

Introduction

The primary objective of this study was to survey one portion of the Missouri National Recreational River (MNRR) for *Nicrophorus Americanus,* Olivier also known as "American Burying Beetle" (ABB), an endangered species. The reason this survey was significant was that a single specimen of ABB was recorded from Elk Point, SD in 1945 (Backlund and Marrone, 1997) making it possible for this species to be found in the survey area coupled to the U.S. Army Corps of Engineers (USACE) project to create and maintain emergent sand bar habitat for "piping plover" and "interior least term" through mechanical and chemical means as authorized by the U.S. Fish and Wildlife Service's (USF&WS) "revised biological opinion". If ABB occupied the survey area they could potentially be affected by the aforementioned USACE project as well as by other USACE activities. The evidence provided by this survey indicates that ABB either does not utilize this habitat within its range or has been extirpated from this part of its former range.

Study Area

The study area for this survey consisted of islands and sandbars between river miles 784.0 and 790.8 within the boundaries of the MNRR. All trap sites were within the ordinary water lines of the Missouri River proper. There were three (3) vegetation types represented amongst the twelve trap sites that may more accurately be described as successional stages of a single type. Four of the twelve trap sites consisted mostly of bare sand with scattered cottonwood and willow seedlings and scattered bunch grass, partridge pea, horsetail and other's herbaceous plants (early successional stage). Three trap sites were in areas where vegetation was thicker than that just described (such that few areas of bare sand were present) with the same plants as just described with the addition of purple loosestrife and some dogwood up to shoulder height but no woody plants higher than human height (later successional stage). Five trap sites were on Goat Island where cottonwood, willow, red cedar and dogwood formed mature if not old stands (later yet successional stage). These three vegetational types will subsequently be referred to as A, B and C from youngest to oldest. The three also were clearly different in elevation from normal stage height for early August 2005 (Gavins Point Outflow ~ 23,400 cfs.). "A" sites were < 1 m above water surface, "B" sites were 1-2m above water surface and "C" sites were > 2 m above water surface.

Soil types for Goat Island, NE are not yet available online but soil types for all SD islands (7 trap sites) are shown as (Nb) Norway loamy fine sand, 0 to 4 percent slope (USDA, 2001). Indeed all soils were very sandy with little slope. The soil of Goat Island, NE appears very similar to this untrained individual.

Methods

All surveys utilized baited pitfall traps as suggested by Bedick et al (2004). Traps were constructed of open, plastic, five gallon buckets buried to the rim in the ground. The buckets were not drilled to preclude ground water seepage into the buckets. Each bucket was covered by a slightly elevated (using local materials such as sticks), 61 cm x 61 cm (2ft. x 2ft.) ¼ inch plywood square to prevent both rain from filling the buckets and sunlight from overheating captured animals. A weight (ie. a log) was placed on top of each plywood square. The bottom of each trap was filled to a depth of approximately 5-6 cm with damp sand to enable captured animals to burrow to escape heat and/or each other. After baiting, an appropriate size piece of cottonwood bark was placed in each trap. In the event rainfall flooded a trap, it was hoped the bark would serve as a liferaft for trapped animals. No trap ever flooded.

Two different baits were used. Eight traps received 1 pound of ripe beef liver in commercial plastic containers with numerous small holes punched in the lid. Four traps received road-killed cottontail rabbits frozen until used then cut transversely in rough halves using a machete. Although both baits produced strong aromas and both attracted beetles, the rabbit halves were clearly the superior bait.

Traps were checked daily starting at 6:00 AM and were always done before 12:00 noon (usually earlier) dependent upon how many animals had to be emptied and travel time up and down river. No loss of any specimens due to adverse trap conditions were noted. Predation of some trapped specimens by others was noted – especially diptern larvae (maggots) by staphylinids (rove beetles).

Results

No ABB were captured. Forty eight (48) specimens of *Nicrophorus* sp. Fabricius were captured in eight different traps so it is believed that the pitfall traps were effective for this genre in this area. Only three of these specimens were retained as vouchers and all three were identified as *Nicrophorus orbicollis*, say using Dillon and Dillon's two volume set titled A Manual of Common Beetles of Eastern North America (1972). All other captured *Nicrophorus* appeared the same as the three retained and were immediately released. The four traps which failed to yield any *Nicrophorus* spp. were the vegetation type "A" – mostly bare sand-sites. Traps yielding the most *Nicrophorus* spp. were those in type "C" vegetation – the most mature of the survey's vegetation types. Other animals caught in these traps included: toads, hunting spiders, ants, maggots, *Canthon laevis* (Scaradaeidae), *Onthophagus hecate* (Scaradaeidae), *Geotupes blackburnii* (Scaradaeidae), *Copris tullius* (Scaradaeidae), *Silpha Americana* (Silphidae), *Staphylinus* either *violaceus* or *cinnamopterus* (Staphylinidae), *Creophilus maxillosus* (Staphylinidae) and *Brachyrhinus ovatus* (Curculionidae). Traps located in type "A" (mostly bar sand) caught almost exclusively toads and hunting spiders.

Acknowledgements

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Footnotes

1. Unionid work in this reach of the river associated with this grant will be reported to NPS, USF&WS and SDGF&P as part of the 2006 report to NPS on broader unionid surveys.
2. Unionid work associated with this grant and done between Pickstown, SD and Niobrara, NE has already been reported to SDGF&P and is part of the Stephan Wilson/Doug Backlund report.
3. Habitat for clam shrimp although searched for, was simply not present during the summer 2006.

References

Backlund, Douglas C. and Gary Marrone. 1997. New Records of the Endangered American Burying Beetle *Nicrophorus Americanus* Olivier, (Coleoptera:Silphidae) in South Dakota. The Coleopterists Bulletin, 51(1): 53-58.

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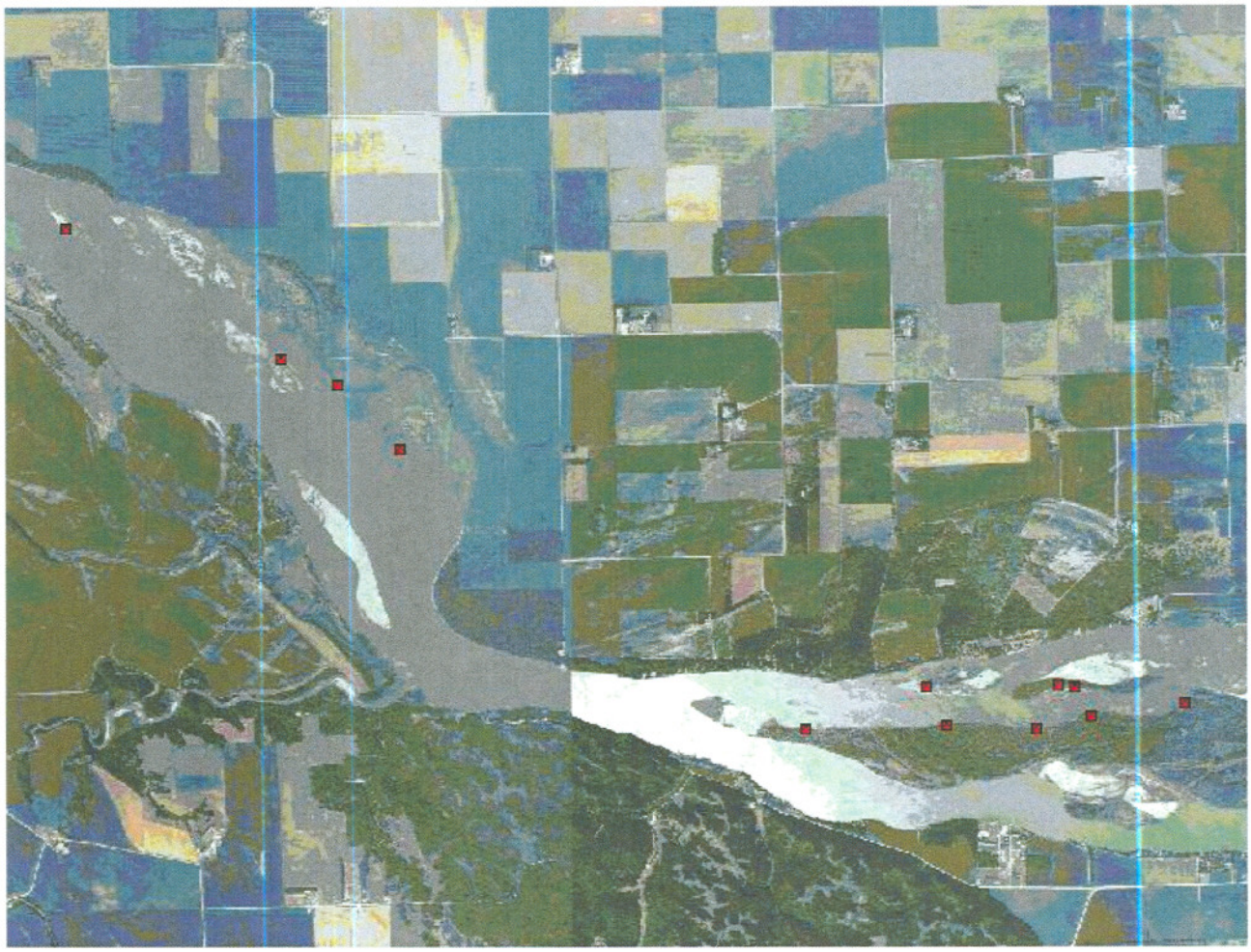
Beetle Trap Sites During the 2005 Survey



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