RM-CESU - Project Progress Report, FY06

Project Title: Literature Study and Monitoring Strategies for Eight Insect Species of the Great Sand Dunes National Park

Park: Great Sand Dunes National Park

Funding Sources: Rocky Mountain CESU Technical Assistance Funding ($5,000)

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Student Participant: Travis Gilchriest (pending)

Project Description:

Literature review will be conducted to accumulate information on the 8 insect species of interest from the GRSA NP. These species include:

1. The Great Sand Dunes Tiger Beetle, *Cicindela theatina* (Coleoptera, Cicindellidae)
2. Darkling or Circus Beetle, *Eleodes hirtipennis* (Coleoptera, Tenebrionidae)
3. Werner's Ant-like Flower Beetle, *Amblyderus werneri* (Coleoptera, Anthicidae)
4. Triplehorn's Ant-like Flower Beetle, *Amblyderus triplehorni* (Coleoptera, Anthicidae)
5. Hister Beetle, *Hypocaccus sp.* (Coleoptera, Histeridae)
6. Noctuid Moth, *Copablepharon sp.* (Lepidoptera, Noctuidae) [*Copablepharon pictum* has been described, see citation]
7. Robber Fly, *Proctacanthus sp.* (Diptera, Asilidae)
8. Giant Sand Treader Camel Cricket, *Daihinibaenetes giganteus* (Orthoptera, Rhaphidophoridae)

It is anticipated that the literature review will provide sufficient amount of data regarding biology, ecology, distribution, and behavior of the 8 insect species of interest. However, the level of knowledge regarding these species varies greatly.

Outline of monitoring protocol: prior to extensive bibliographical research, only a very general outline of the possible monitoring protocol can be made. The protocol outline (and eventually any final protocol) will include key components of a long-term monitoring protocol as described by Oakley et al. (2003) which is the standard format required by the NPS Vital Signs Monitoring Program. One of the crucial questions is the spatiotemporal location of samples, which might be restricted by limited financial resources for this project. The target insect species belong to different taxonomic groups,

and their phenology can be quite different too. Based on the preliminary information it appears to be sufficient to attempt active sampling at three to four short periods within the growing season in order to capture most of the targets. Passive sampling (see below) can be conducted at longer periods. The exact dates and geographic (and microhabitat) locations for sampling efforts will be identified through literature research and consultations with specialists who have experience working at GRSA NP (Phyllis Pineda-Bovin).

Project Progress:

Since project inception in August 2006, literature review is currently in progress. The list of main literature sources was compiled in collaboration with Phyllis Pineda Bovin. It includes:

1. Kippenhan, M. G. 1990. A survey of the tiger beetles (Coleoptera: Cicindelidae) of Colorado. *Entomological News* 101(5): 307-315.

2. Kippenhan, M. G. 1994. The tiger beetles (Coleoptera: Cicindelidae) of Colorado. *Transactions of the American Entomological Society* 120 (1): 1-86.

3. Lafontaine, J.D. 2004. Noctuoidea: Noctuidae (part), Noctuinae (part-Agrotini). *The Moths of America North of Mexico, Fascicle 27.1.* The Wedge Entomological Research Foundation, Washington, D.C. 385 pp..

4. Oakley, K.L., Thomas, L.P., & Fancy, S.G. 2003. Guidelines for long-term monitoring protocols. *Wildlife Soc. Bull.* 31(4):1000-1003.

5. Pineda P.M., Rondeau R.J., & Ochs A., 1999. *A Biological Inventory and Conservation Recommendations for the Great Sand Dunes and San Luis Lakes, Colorado.* The Nature conservancy, San Luis Valley Program, Saguache, CO

6. Pineda, P. M. 2002. *Natural History of the Great Sand Dunes Tiger Beetle and Invertebrate Inventory of Indian Spring Natural Area at Great Sand Dunes, Colorado*. Master's of Science Thesis. Department of Bioagricultural Sciences and Pest Management. Colorado State University, Fort Collins, Colorado.

7. Pineda, P. M. & B. C. Kondratieff, 2002. Description of the larval stages of *Cicindela theatina.* Publ.??

8. Pineda, P.M. & B.C. Kondratieff, 2003. Natural History of the Colorado Great Sand Dunes Tiger Beetle, *Cicindela theatina* Rotger. *Transactions of the American Entomological Society* 129 (3-4): 333-360.

9. Rotger, B. 1944. A new species of *Cicindela* and two new records of Coleoptera. *Pan-Pacific Entomologist* 20 (2): 76-77.

10. Smith D.I., Lockwood J.A., Latchininsky A.V., & Legg D.E., 2006. Changes in non-target arthropod populations following application of liquid bait formulations of insecticides for control of rangeland grasshoppers. *International Journal of Pest Management* 52(2): 125-139.

11. Weissmann, M.J. 1995. *Natural history of the giant sand treader camel cricket, Daihinibaenetes giganteus Tinkham (Orthoptera:Rhaphidophoridae), at Great Sand Dunes National Monument, Colorado.* Ph.D. Dissertation. Colorado State University, Fort Collins, Colorado.

12. Weissmann, M. J. and B. C. Kondratieff, 1999a. An inventory of arthropod fauna at Great Sand Dunes National Monument, Colorado. *University of Kansas Natural History Museum Special Publication No. 24*: 69-80.

13. Weissmann M.J. & Kondratieff B.C., 1999b. Two new species of *Amblyderus* from Great Sand Dunes National Monument, Colorado (Coleoptera: Anthicidae). *Entomol. News* 110: 137-143.

14. Weissmann M.J., Clement L.P., & Kondratieff B.C., 1993. *Insects and other Arthropods of the Great Sand Dunes National Monument.* Southwest Parks and Monuments Association, Tucson, AZ.

Follow-up of this project:

The decision on the follow-up will be made based on the results of the project.

Publications, other reports expected/ with dates:

Project report will be completed by the due date (December 31, 2007).