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ORD 2382-73

20 JUN 1973

MEMORANDUM FOR: Deputy Director for Science and Technology

SUBJECT: Request for Approval of Proposed Research with the U.S. Department of Interior, Division of Wildlife Research

1. This memorandum requests approval for the committment of funds to support the continuation of a research program. The request is contained in paragraph 7.

2. The ultimate goal of this program is to utilize migratory birds as sensor vehicles and/or as detectors of environmental substances in specified areas of interest. In the first case, the bird might transport and return a sensor package from an area of interest, or perhaps merely fly through the area. In the second case, the birds which have temporarily resided in a target area would be retrieved and subjected to intensive analysis to determine environmental stimuli or substances to which they have been exposed during the period of residence. The proposed project is primarily concerned with the second case, i.e., utilization of the bird as a biosensor. An orinthological survey has been conducted by [redacted] which delineates the frequency and species of birds that might be expected in specified target areas. The Department of Interior, Division of Wildlife Research, is the foremost authority on migration of birds and possesses highly qualified scientific personnel, equipment, and a unique computer bank of bird banding data. Consequently, the assistance of the Division of Wildlife Research will be invaluable in determining the feasibility of achieving the desired goal. In brief, this assistance would consist of providing statistical models of bird migration patterns and probable distribution through the flyways and at the destination. Specific

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target area destinations will be provided by the sponsor. Such data are required for cost effectiveness evaluation of the potential system as well as the establishment of experimental field trial design should this initial statistical analysis indicate potential application.

3. The essential goal of the proposed effort is to select several Western Hemisphere birds analogous to those known to reside in and migrate from selected target areas. On the basis of available Department of Interior banding data, a statistical model of bird distribution along flyways and at destination will be constructed. (See attached Work Statement.) Such data will allow cost effectiveness decisions to be made concerning the number of birds that would have to be retrieved for biochemical analysis to provide reliable target area information. The analytical study will provide means and standard deviations for geographical distribution and mortality of birds along the flight paths as well as probable distribution in the target area. The designated target for which western analogs will be selected is the Shikhany CW test site. Attachment I, Utilization of Migratory Birds as Biosensors, provides evidence as to the feasibility of the concept. That is, migratory birds will incorporate CW trace material from low level concentrations in the target habitat and these signatures will be detectable by available biochemical techniques. Attachment II indicates probable bird populations in selected target areas.

4. The proposed research will extend over a six-month period at a cost of approximately $25,000. In addition to the obviously required coordination with the Department of Interior, internal coordination has been established with Dr. Karl Weber (OSI), Mr. Donald Reiser (ORD), and Mr. David Boston (OTS).

5. It is anticipated that this will be a five-phase program from initial feasibility investigation to operational test and evaluation. Each successive phase will provide decision data for determination of program continuance. The first phase of the program was completed under contract to [redacted], in which the frequency and reliability of migratory bird habitation in [redacted] targets were determined. The proposed effort with the Department of Interior constitutes the second phase of the program. Follow-on efforts

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will consist of: (a) field evaluation of the statistical pattern analysis derived from the bird banding computer data (FY 74, $70K); (b) determination of bird uptake, metabolism, and excretion of controlled amounts of CW degradation products (FY 75, $40K); and (c) field evaluation of migratory bird absorption and retention of CW degradation products in the concentrations and dietary form (natural vegetation, seeds, etc.) anticipated in the selected target area (FY 75, $150K).

6. The Project Officer for this contract will be [redacted] extension 3658. The Sterility Code 1 is appropriate for this contract. All other aspects of the contractual effort, other than Agency-Department of Interior association, will be UNCLASSIFIED.

7. The Office of Research and Development recommends the transfer of funds to the Department of Interior, Wildlife Research Division for the execution of the work described herein. The funding will be $25,000 for a six-month period.

[redacted]

Sayre Stevens
Director of Research and Development

APPROVED:

[redacted]

Deputy Director for Science and Technology

23 June 73
Date

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