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ST. JOHN, F. L., ADDENDUM TO THE REPORT ON THE SLOAN'S CRAYFISH (ORCONECTES SLOANII BUNDY) AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT, DRAFT - (USED AS A REFERENCE IN THE OU 5 RI REPORT)

06/24/94

PO JM-69471
F. LEE ST. JOHN
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ADDENDUM

Addendum to the Report on the Status of the Sloan's Crayfish, *Orconectes sloanii* (Bundy, 1876), at the Fernald Environmental Management Project (FEMP) (P.O. JM-69471)

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June 24, 1994

Proposal No. JM-69471, dated Nov. 5, 1993, reported on the status of Sloan's crayfish, *Orconectes sloanii* (Bundy, 1876), at the Fernald Environmental Management Project (FEMP) site. This crayfish is a threatened species in Ohio. During the survey (September 15, 1993), specimens of Sloan's crayfish were found at three localities within Paddys Run. One of these sites was located off property south of the FEMP boundary. All three localities were pooled areas while the remainder of the creek bed was dry.

It was predicted in the report that the crayfish would repopulate the run and riffle portions of the stream when water returned to the creek bed following spring rains. It was further suggested that (1) this would occur by upstream migration from the pools which had served as refugia during the summer (and, of course, winter) and (2) that, due to the intermittent nature of Paddys Run, completely repopulating the stream following spring rains, but before summer drying, would be unlikely.

On May 21, 1994, the author examined 25 sites along Paddys Run (three of these were off-property), which was flowing throughout the entire section along the FEMP property. The Storm Sewer Outfall Ditch was also surveyed. Crayfish, where present, were collected by using a minnow seine (1.2 m x 1.8 m; 0.64 cm mesh). They were identified in the field and then returned live to the stream. Seven of the 24 sites yielded crayfish and six of these seven sites yielded specimens of *O. sloanii*. The other crayfish species found in Paddys Run, either alone or in sympatry with *O. sloanii*, was *Orconectes rusticus*, which was also true in the 1993 sampling (Table 1 and Figure 1).

Reference to the 1993 report will show that the two on-property locations where *O. sloanii* was found were two pooled areas, one immediately north and one immediately south of the railroad trestle, in the northwest section of the FEMP property. These correspond to sites 4 and 5 in Figure 1 of this report. The fact that *O. sloanii* was not found at these sites during this survey is not surprising since *O. sloanii* prefers riffles and runs with rocky bottoms. The dry conditions found in September had forced the "survivors" into the less desirable pool habitat where they remained during the summer as well as the winter. Following the spring rains, the species has migrated from the pool refugia to repopulate the runs.

It should be noted that off-property sites in Figure 1 (numbers 23, 24 and 25) are at the same location as site C sampled in 1993, where New Haven Road crosses Paddys Run. The 1993 report map is in error; site 1 should be farther south, beyond the limits of the map.

From the brush and debris caught in vegetation along the banks of Paddys Run, it was obvious that the spring flood(s) preceding the May 21 survey had raised the water level three to four feet above normal and had subjected the stream to a swift current. While crayfish could be dislodged from an upstream pool and redistributed downstream, such a flood current would probably sweep them far downstream. A more likely mode of repopulation would be the slow downstream movement following the cessation of the spring

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flooding. The 1993 report, however, cited Momot (1966): "Crayfish, which have a relatively low reproductive rate, should definitely be added to the list of organisms that repopulate streams by upstream migration rather than by reproduction in situ." It is obvious that in Paddys Run, *O. sloanii* is repopulating by migration, but by downstream migration rather than upstream. This is evident by the specimens collected from sites 6 through 10, just downstream from the pools at the railroad bridge. However, this slow downstream repopulation of the stream has currently extended only about 1000 feet from the pool areas. Further downstream movement may well be limited by the annual summer drying of most of the streambed.

The population of *O. sloanii* appears to be localized near the railroad bridge over Paddys Run in the northwest portion of the FEMP site. The crayfish are confined to the permanent pools at this location when the remainder of the stream is dry and they repopulate the stream in the spring (after the floods) by downstream migration. This is a slow process, proceeding this spring only about 1000 feet by May 21. It is anticipated that further downstream migration may well be hindered by the summer drying of the streambed. Although periodic summer rains may temporarily restore water to intermittent portions of Paddy Run, the discontinuous nature of the habitable parts of the stream will preclude any further significant repopulation. To reiterate the 1993 report, Paddys Run is only marginal habitat for *O. sloanii* for the reasons just cited.

Collecting site 21 (Figure 1) is the Storm Sewer Outfall Ditch. Inasmuch as it was dry at the time of the 1993 report, sampling was again attempted for the current report. The Storm Sewer Outfall Ditch was dry again in May 1994, leading to the conclusion that its extreme intermittent nature makes it an unlikely habitat for any species of stream crayfish.

An off-property population of *O. sloanii* seems to be similarly established near where New Haven Road crosses Paddys Run. However, this population does not appear to migrate significantly upstream to include any part of Paddys Run within the FEMP boundaries. For the study of the FEMP property, this population may be disregarded except (1) as it might be influenced by siltation and/or pollution travelling downstream, or (2) as a possible site for relocation of on-property *O. sloanii*, if needed (however, a more suitable relocation site was suggested in the Nov. 5, 1993, report by this author.). Unfortunately, no studies of crayfish relocation projects are known to the author and the success of such an endeavor is uncertain.

REFERENCES

Momot, W.T. 1966. Upstream movement of crayfish in an intermittent Oklahoma stream. Am. Midl. Nat. 75: 150-159.

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TABLE 1

Collecting Sites	Results
1	no specimens
2	no specimens
3	no specimens
4	no specimens
5	no specimens
6	1 *O. sloanii*
7	3 *O. sloanii*, 3 *O. rusticus*
8	3 *O. sloanii*, 3 *O. rusticus*
9	1 *O. sloanii*, 2 *O. rusticus*
10	1 *O. sloanii*, 2 *O. rusticus*
11	no specimens
12	no specimens
13	no specimens
14	no specimens
15	no specimens
16	no specimens
17	2 *O. rusticus*, 1 unidentified juvenile
18	no specimens
19	no specimens
20	no specimens
21	no specimens
22	no specimens
23	2 *O. sloanii*, 1 *O. rusticus*
24	no specimens
25	no specimens

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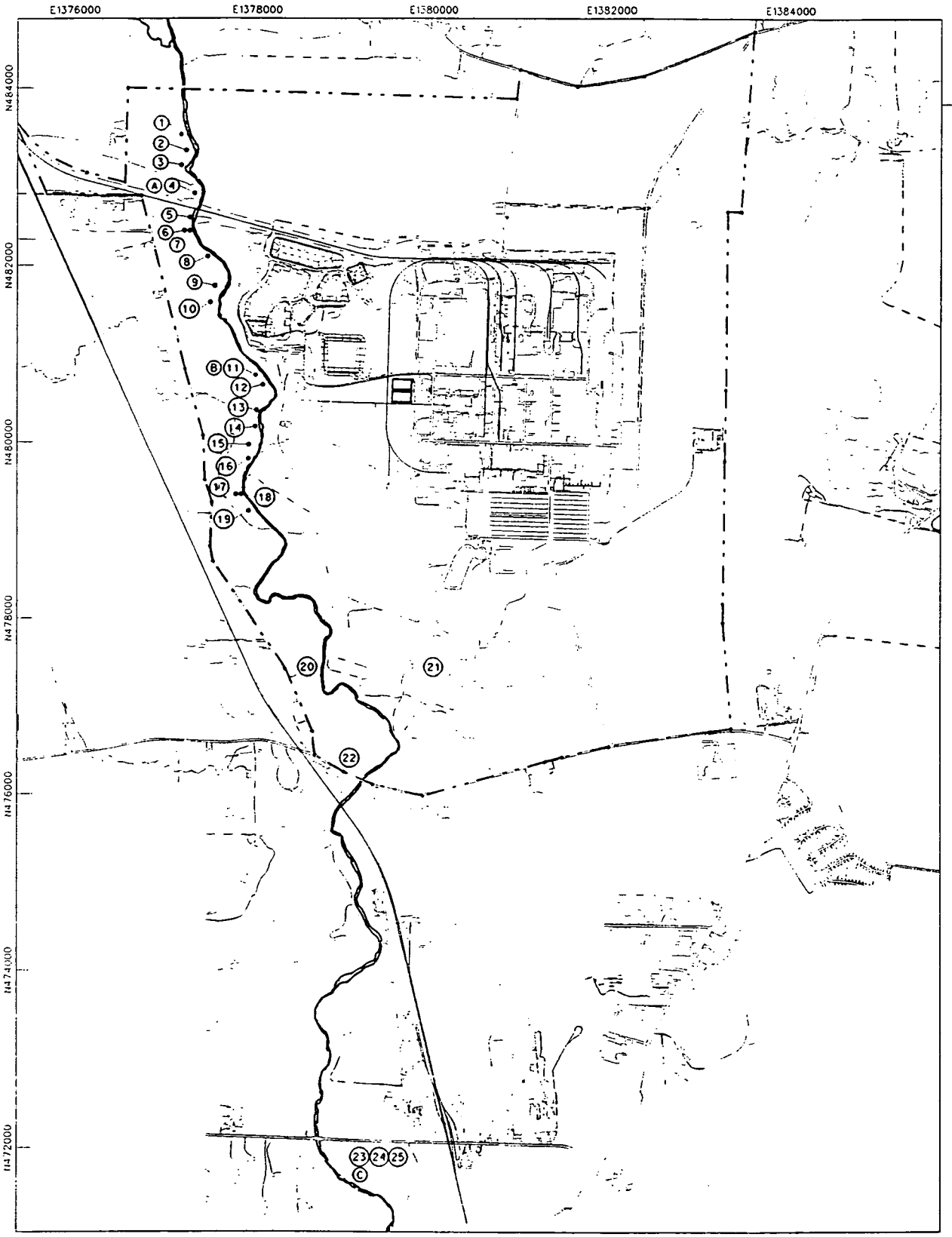
FILE NAME /res2233/fish.dgn 8x11 cru5 5-25-94 GES STATE PLANAR COORDINATE SYSTEM 1927



LEGEND:

— · · — · ·	FEMP BOUNDARY
A-C	1993 SAMPLING LOCATIONS
1-25	1994 SAMPLING LOCATIONS

SCALE

1500 750 0 1500 FEET

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4.4.1

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Fernald Environmental

FERMCO

Restoration Management Corporation P.O. Box 398704 Cincinnati, Ohio 45239-8704 (513) 738-6200

August 9, 1994

U. S. Department of Energy
Fernald Environmental Management Project
Letter No. C:OP:94-0710

Mr. Ray J. Hansen, Acting Director
Department of Energy
Fernald Field Office
P. O. Box 398705
Cincinnati, Ohio 45239-8705

Dear Mr. Hansen:

CONTRACT DE-AC05-92OR21972, NEPA DOCUMENT TRANSMITTAL: SUBCONTRACTOR SURVEY FOR THE STATE-LISTED THREATENED SLOAN'S CRAYFISH

This letter transmits the report regarding the second survey completed for the state-listed threatened Sloan's crayfish (*Orconectes sloanii*). This survey updated the status of this species during periods of regular water flow though Paddys Run. The 1993 survey was performed during a period of low water flow when many sections of Paddys Run were dry. The 1994 survey reports some change in the location of the crayfish population, but the species has not repopulated the entire stream after the dry periods.

The survey was completed to comply with the National Environmental Policy Act (NEPA), the Endangered Species Act, and the Ohio Revised Code and is being forwarded to you for your information. If you have any questions or require supplemental information, our point of contact is Eric Woods at 738-8661 or Rebecca Bixby at 738-9305.

Sincerely,

Don Ofte, President

DO:RB:nlt
Attachment

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Fernald Environmental
FERMCO
Restoration Management Corporation

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