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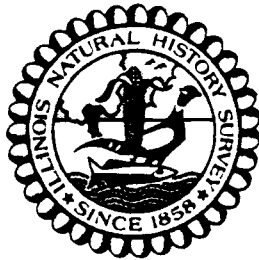
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ILLINOIS NATURAL HISTORY SURVEY

SURVEY OF ROCK RIVER MUSSELS (MOLLUSCA: UNIONIDAE) AT THE
ILLINOIS ROUTE 2 (FAP 742) BRIDGE SOUTH OF GRAND DETOUR,
LEE AND OGLE COUNTIES, ILLINOIS. IDOT JOB NUMBER P-92-008-83.

Final Report



31 December 1986

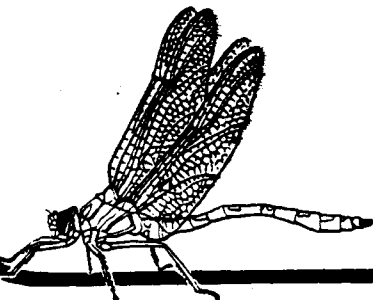
Section of Faunistic Surveys and Insect Identification Technical Report

by

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Prepared for

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Section of Faunistic Surveys and Insect Identification
Technical Report 1986 (12)

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INTRODUCTION

The Illinois Department of Transportation (IDOT), Bureau of Location and Environment, is required to comply with Section 404(b)1 of the Clean Water Act when projects have the potential to impact on aquatic environments. In addition, IDOT is required by Section 7 of the Endangered Species Act of 1973, as amended, to conduct a biological inventory for the purpose of identifying federally listed endangered and threatened species likely to be affected by its highway construction projects. IDOT also wishes to consider in a similar fashion those species listed as endangered or threatened in Illinois by the state Endangered Species Protection Board. In many cases, the general distribution patterns of these species are known, but specific records from given project areas are not available. Usually a field reconnaissance and review of appropriate publications and museum records are necessary to determine whether or not a species actually occurs or is likely to occur in a project area.

Under the proposed IDOT project FAP 742, a 15.3-mile segment of Illinois Route 2 from Dixon in Lee County to Oregon in Ogle County would be improved through roadbed reconstruction, horizontal and vertical curve corrections, construction of truck climbing lanes, and the rebuilding of ditches. In conjunction with this project, the Illinois Natural History Survey conducted an inventory to determine the actual or likely occurrence of freshwater mussels (Mollusca: Unionidae) within the project area.

Three specific sites within the FAP 742 project area were assessed for the presence of mussels: Mussel Study Site A - the subject of this report - is located in the immediate vicinity of the present Illinois Route 2 bridge across the Rock River just south of Grand Detour (IDOT-FAP 742 stations 225 through 232). Surveys for mussels at Mussel Study Sites B and C, located north of Grand Detour (IDOT-FAP 742 stations 560 and 608, respectively), were conducted, in part, during 1985 and 1986. The results of these additional surveys will be discussed in a separate report.

During our survey for Rock River mussels, particular attention was given to species listed or considered for listing as endangered or threatened by the U.S. Department of the Interior, Fish and Wildlife Service (USDI, FWS) (1984a, 1984b) which, based upon past records and information about habitat preferences, are known or thought likely to occur in the Rock River. Special attention also was directed toward those species of mussels currently under consideration for state listing as endangered or threatened.

DESCRIPTION OF STUDY AREA

The Rock River site surveyed for mussels and discussed in this report is located in the immediate vicinity of the existing Illinois Route 2 bridge, just south of Grand Detour, in Lee and Ogle counties, Illinois (Figure 1, Mussel Study Site A). The legal locality of the study area, taken from a U. S. Geological Survey topographic quadrangle map, is as follows:

ILLINOIS, Lee and Ogle counties, Rock River, 1.0 km SSW Grand Detour.
4th Principal Meridian: T.22N, R.9E, SW/4, Sec. 13, and SE/4, Sec. 14
(indefinite boundaries). U.T.M.: Zone 16: 299200m E, 4640200m N.
Grand Detour, Illinois (7.5' series, 1983 provisional ed.) USGS
topographic quadrangle map.

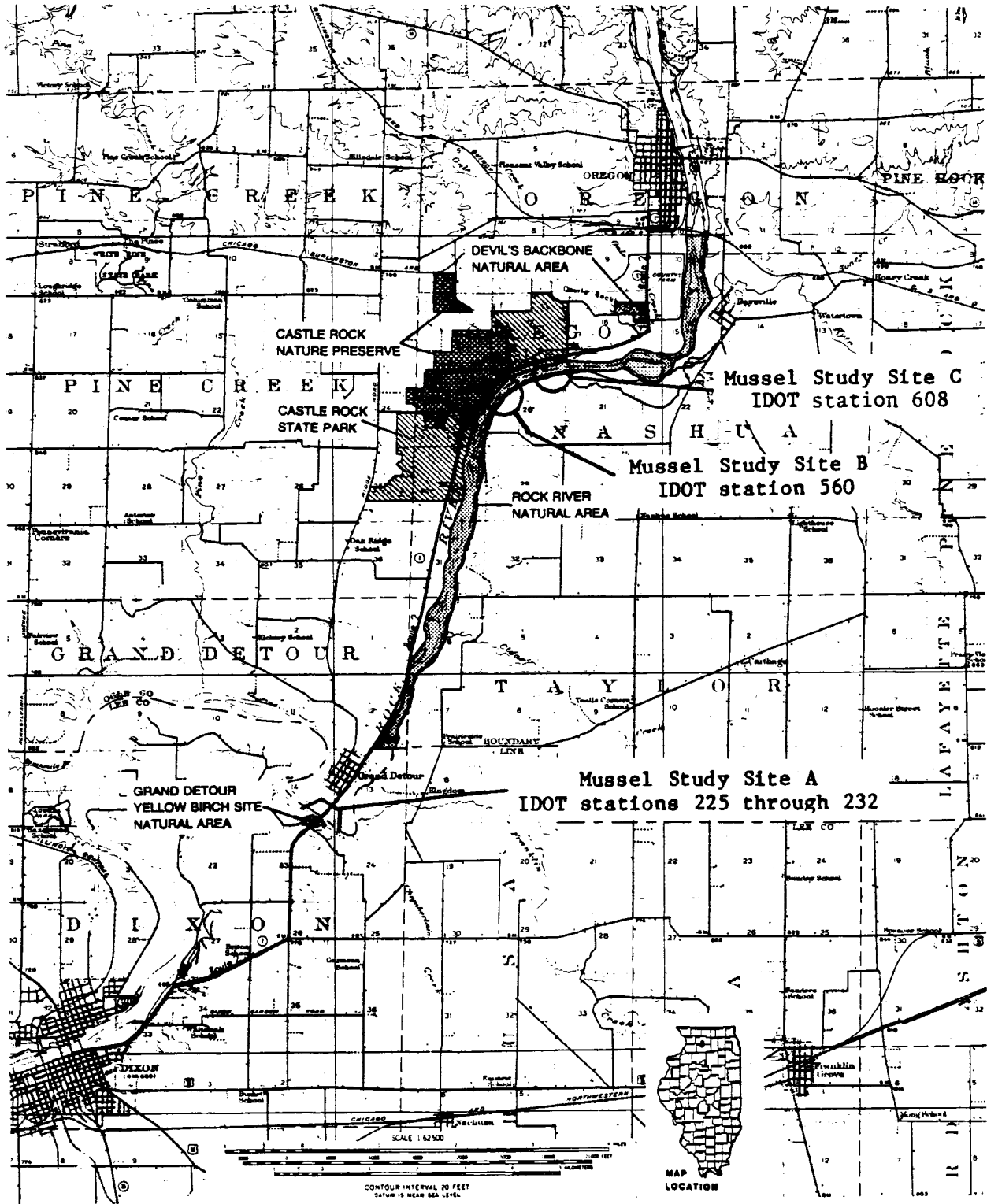


Figure 1. Location of the FAP 742 project area along a 15.3-mile stretch of Illinois Route 2 between Dixon in Lee County and Oregon in Ogle County, Illinois.

METHODS

In order to determine the abundance and species composition of unionid mussels in the Rock River in the vicinity of the existing Illinois Route 2 bridge (FAP 742) mussels were sampled quantitatively and qualitatively using SCUBA. Sampling was conducted on 30 and 31 October 1985 by INHS malacologist Jeanine M. Kasprowicz, INHS biologists Mark J. Wetzel and Douglas A. Carney, malacologist/diver David J. Heath of Malacological Consultants, La Crosse, Wisconsin, and divemaster Douglas A. Brown. Poor weather conditions and other project obligations prevented a completion of this survey after October 1985. The above personnel returned on 31 August 1986 to complete the survey for Rock River mussels at this site.

Quantitative Survey. Three transects were established across the river in the immediate vicinity of the existing bridge (Figure 2). Transect I was located approximately 100 m upstream of the bridge, roughly following an old, indefinite bridge alignment. (This old alignment is one of the alternative alignments for the proposed new bridge.) More specifically, this transect extended across the river from a point 120 m upstream of the existing bridge on the south (Lee County) side of the river to a point 80 m upstream of the bridge on the north (Ogle County) side of the River. Transect II was located 10 m upstream of and parallel to the existing bridge. Transect III was located 10 m downstream of and parallel to the existing bridge. A series of sampling points was established along each transect at approximately regular intervals. A total of 50 points was sampled along all three transects (Figure 2).

At each quantitative sampling point, the diver searched two adjacent 1-m² areas (each delineated by a square metal frame) for mussels. Since the turbidity of the water prevented visual inspection of the bottom, the diver located mussels by feeling over and digging with his fingers a short depth into the substrate. All living mussels and dead shells were collected from within the frame and returned to the surface for processing.

Qualitative Survey. Qualitative sampling for mussels, particularly *Simpsoniias ambigua* (a species currently under consideration for federal listing as endangered) was conducted around a large rock outcrop which extends out into the river. This area is located on the south (Lee County) shore of the Rock River, approximately 120 m upstream of the existing Illinois Route 2 bridge (Area "S", Figure 2). In addition, qualitative sampling was conducted around each of the two bridge pilings.

All shells (living and dead) were identified; live mussels were enumerated, and the presence of species of dead and subfossil shells not collected alive was noted. At least one specimen of each species collected either alive or as a dead shell was retained as voucher material. All other mussels were returned to the river. Voucher specimens were deposited in the mollusk collections of the Illinois Natural History Survey and the University of Wisconsin (Madison) Zoological Museum. Nomenclature follows Council of Systematic Malacologists and American Malacological Union Committee on Scientific & Vernacular Names (1985, in press) except for the *Pleurobema cordatum* complex [including *P. cordatum* (Rafinesque, 1820) and *P. coccineum* (Conrad, 1834)] (see Starrett 1971).

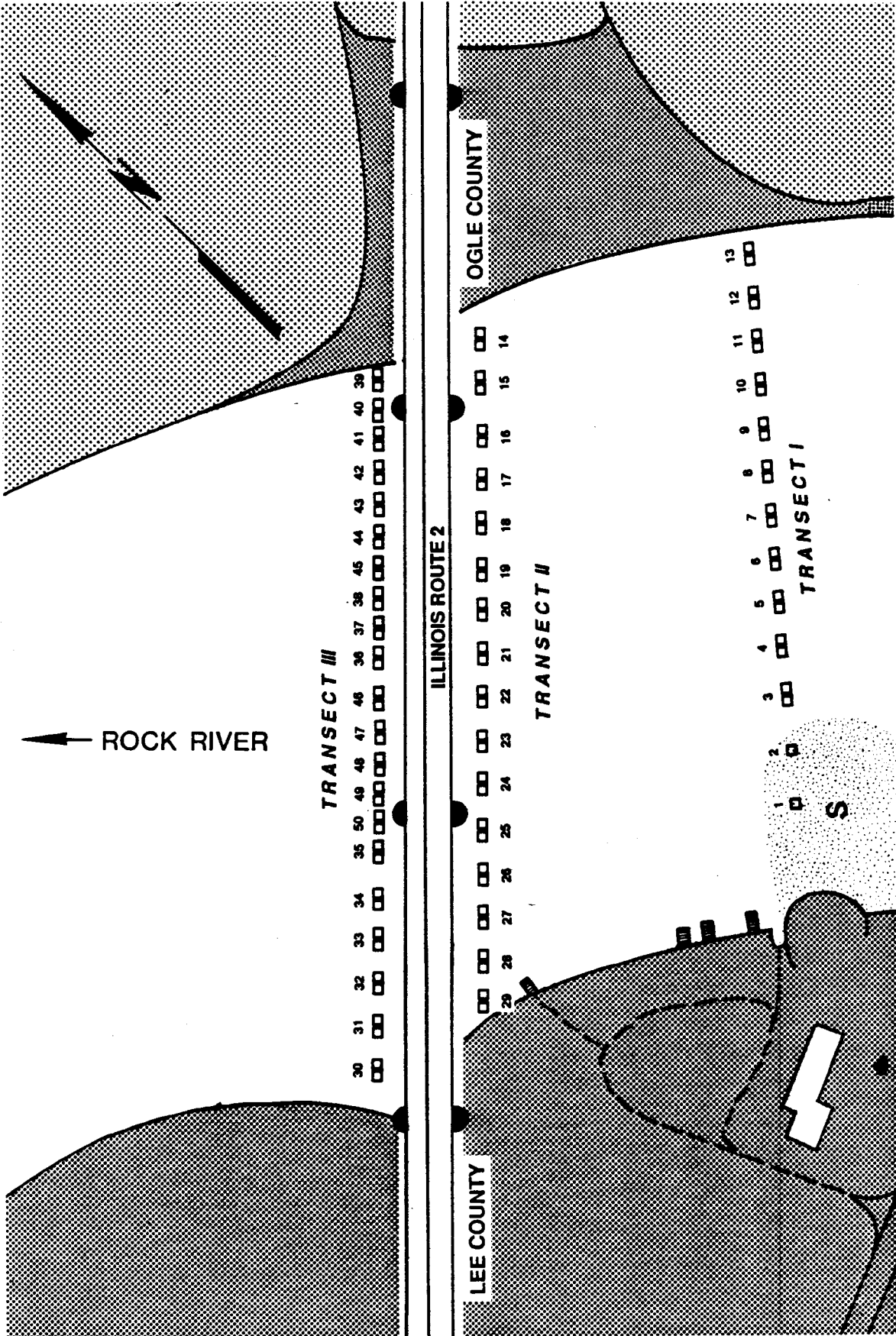


Figure 2. Mussel Study Site A. Sampling locations for unionid mussels collected quantitatively from the Rock River at the Illinois Route 2 bridge south of Grand Detour in Lee and Ogle counties, Illinois, on 30 and 31 October 1985 (sampling points 1 through 38) and on 31 August 1986 (sampling points 39 through 50). Area "S" represents bedrock substrate surveyed qualitatively for *Simpsoniaca ambigua*. Scale: 1" = 100'.

RESULTS

During this survey 53 live unionid mussels representing 8 genera and 9 species were collected quantitatively from the Rock River at the Illinois Route 2 bridge south of Grand Detour (Table 1). *Quadrula pustulosa pustulosa* accounted for 45.3% of the collection and *Lampsilis ventricosa* accounted for 20.8%. No other species accounted for more than 10% of the collection.

Table 2 lists the numbers and species of mussels collected from each sampling point in the Rock River on 30 and 31 October 1985 (sampling points 1 through 38), and on 31 August 1986 (sampling points 39 through 50). The composition of the substrate in the study area, as described by the diver, varied from one end of each transect to the other, and included bedrock, sand over gravel, pea gravel, large gravel, silt/mud over sand, and silt over gravel. The substrate type encountered at each sampling point also is noted in Table 2.

Live mussels were collected from fewer than half (38) of the 98 1-m² quadrats sampled. No more than four live mussels were found in any single quadrat, and only one quadrat contained four individuals. Two quadrats yielded three mussels each; eight yielded two mussels; 27 yielded one mussel. No live mussels were found in 60 of the 98 quadrats.

Table 3 lists the six mussel species which were collected on 30 and 31 October 1985 and on 31 August 1986 only as dead or subfossil (very old, chalky, worn, and usually as single valves) shells. No dead or subfossil valves of any federally listed endangered or candidate species were found.

An apparently recent muskrat midden consisting mainly of *Truncilla donaciformis* valves was discovered on 31 October 1985 under a boat dock along the left (south) bank of the river, located between Transects I and II. Shells of one *Lampsilis ventricosa*, one *Potamilus laevis*, and several *Quadrula pustulosa pustulosa* also were present in this midden.

Qualitative sampling around the bridge pilings during the 1985 and 1986 surveys yielded only one live *Anodonta grandis grandis*, found on the north side of the northernmost bridge piling. One live *Ligumia recta* and one live *Quadrula pustulosa pustulosa* were collected from the outside edges of grids placed at quantitative sampling points.

During the October 1985 segment of this survey, our diver, Mr. David J. Heath, observed numerous cracks and ledges along the submerged part of a limestone outcrop located on the south side of the river (Figure 1, area "S"). These cracks and ledges are of the type that yielded *Simpsonaias ambigua* in the Wisconsin River. However, poor weather conditions prevented a careful investigation of this area during the October 1985 survey.

While completing our survey of this project site on 31 August 1986, Mr. Heath thoroughly searched this bedrock area for *Simpsonaias ambigua*. No live, dead, or subfossil *S. ambigua* were discovered. Several live mussels were collected qualitatively from this bedrock area during the search for *S. ambigua*, including *Anodonta grandis grandis* (9), *Anodonta imbecillis* (3), *Lasmigona complanata* (1), *Ligumia recta* (1), and *Quadrula pustulosa pustulosa* (3).

Table 1. Species and numbers of live unionid mussels collected quantitatively from the Rock River in the immediate vicinity of the Illinois Route 2 bridge just south of Grand Detour in Lee and Ogle counties, Illinois, on 30 and 31 October 1985 and on 31 August 1986.

SPECIES	NUMBER COLLECTED
<i>Anodonta grandis grandis</i> Say	4
<i>Lampsilis radiata siliquoidea</i> (Barnes)	1
<i>Lampsilis ventricosa</i> (Barnes)	11
<i>Lasmigona complanata</i> (Barnes)	3
<i>Leptodea fragilis</i> (Rafinesque)	1
<i>Potamilus laevissima</i> (Lea)	3
<i>Quadrula pustulosa pustulosa</i> (Lea)	24
<i>Strophitus undulatus</i> (Say)	4
<i>Truncilla donaciformis</i> (Lea)	2
	53
Total	

Table 2. Species and numbers of live mussels collected at each sampling point during quantitative sampling in the vicinity of the Illinois Route 2 bridge south of Grand Detour in Lee and Ogle counties, Illinois, on 30 and 31 October 1985 (sampling points 1 through 38), and on 31 August 1986 (sampling points 39 through 50), with substrate composition at each sampling point.

SAMPLING POINT†	SPECIES	NUMBER	SUBSTRATE COMPOSITION
TRANSECT I			
1	-	-	Bedrock
2	-	-	Bedrock
3a	<i>Lampsilis ventricosa</i>	1	Sand and rocks
b	-	-	Sand and rocks
4a	-	-	Pea gravel
b	-	-	Pea gravel
5a	<i>Lampsilis ventricosa</i>	1	Pea gravel
b	-	-	Pea gravel
6a	-	-	Pea gravel
b	<i>Quadrula p. pustulosa</i>	2	Pea gravel
7a	<i>Quadrula pustulosa</i>	1	Pea gravel
b	<i>Strophitus undulatus</i>	1	Pea gravel
8a	-	-	Pea gravel
b	<i>Lampsilis ventricosa</i>	1	Pea gravel
9a	-	-	Sand
b	<i>Lampsilis ventricosa</i>	1	Sand
10a	-	-	Sand
b	<i>Lampsilis ventricosa</i>	1	Sand
11a	<i>Lampsilis ventricosa</i>	1	Sand
b	-	-	Sand
12a	-	-	Silt
b	-	-	Gravel
13a	-	-	Mud
b	<i>Anodonta g. grandis</i>	1	Mud
	<i>Lasmigona complanata</i>	1	

(Table 2 continued on next page)

Table 2 (continued).

SAMPLING POINT [†]	SPECIES	NUMBER	SUBSTRATE COMPOSITION
TRANSECT II			
14a	-	-	Silt
b	-	-	Silt
15a	-	-	Silt
b	-	-	Silt
16a	-	-	Silt over gravel
b	-	-	Silt over gravel
17a	-	-	Silt over gravel
b	-	-	Silt over gravel
18a	-	-	Gravel
b	<i>Lasmigona complanata</i>	1	Gravel
19a	-	-	Sand and gravel
b	<i>Quadrula p. pustulosa</i>	1	Sand and gravel
20a	<i>Lampsilis ventricosa</i>	1	Sand and gravel
	<i>Quadrula pustulosa</i>	1	
b	<i>Truncilla donaciformis</i>	1	Sand and gravel
21a	<i>Quadrula p. pustulosa</i>	2	Pea gravel
b	<i>Quadrula p. pustulosa</i>	2	Pea gravel
	<i>Potamilus laevissima</i>	1	
22a	<i>Lampsilis ventricosa</i>	2	Pea gravel
	<i>Quadrula p. pustulosa</i>	1	
b	<i>Lampsilis ventricosa</i>	1	Pea gravel
	<i>Strophitus undulatus</i>	1	
	<i>Quadrula p. pustulosa</i>	2	
23a	<i>Quadrula p. pustulosa</i>	2	Pea gravel
b	<i>Quadrula p. pustulosa</i>	1	Pea gravel
24a	<i>Quadrula p. pustulosa</i>	1	Mixed gravel
b	-	-	Mixed gravel
25a	-	-	Gravel
b	-	-	Gravel

(Table 2 continued on next page)

Table 2 (continued).

SAMPLING POINT [†]	SPECIES	NUMBER	SUBSTRATE COMPOSITION
26a	-	-	Gravel
b	-	-	Gravel
27a	-	-	Gravel
b	-	-	Gravel
28a	-	-	2" silt over gravel
b	<i>Quadrula p. pustulosa</i>	1	2" silt over gravel
29a	-	-	Silt and mud
b	-	-	Silt and mud
TRANSECT III			
30a	<i>Lasmigona complanata</i>	1	Silt
b	<i>Lampsilis r. siliquoidea</i>	1	Silt
31a	-	-	Gravel
b	-	-	Gravel
32a	<i>Leptodea fragilis</i>	1	Gravel
b	<i>Quadrula p. pustulosa</i>	2	Gravel
33a	-	-	Gravel
b	-	-	Gravel
34a	-	-	Gravel
b	-	-	Gravel
35a	<i>Lampsilis ventricosa</i>	1	Gravel
b	-	-	Gravel
36a	<i>Strophitus undulatus</i>	2	Sand, some gravel
b	<i>Anodonta g. grandis</i>	1	Sand, some gravel
	<i>Quadrula p. pustulosa</i>	1	
37a	-	-	Sand, some gravel
b	-	-	Sand, some gravel
38a	-	-	Sand, some gravel
b	-	-	Sand, some gravel

(Table 2 concluded on next page)

Table 2 (concluded).

SAMPLING POINT [†]	SPECIES	NUMBER	SUBSTRATE COMPOSITION
39a	<i>Potamilus laevisissima</i>	1	Silt over Gravel
b	-	-	Silt over Gravel
40a	<i>Anodonta g. grandis</i>	1	Silt and Detritus over Gravel
b	<i>Anodonta g. grandis</i>	1	Silt and Detritus over Gravel
41a	-	-	Gravel
b	-	-	Gravel
42a	-	-	Gravel
b	-	-	Gravel
43a	-	-	Gravel
b	-	-	Gravel
44a	<i>Quadrula p. pustulosa</i>	1	Gravel
b	<i>Quadrula p. pustulosa</i>	1	Gravel
45a	<i>Truncilla donaciformis</i>	1	Gravel
b	-	-	Gravel
46a	<i>Quadrula p. pustulosa</i>	1	Gravel
b	<i>Potamilus laevisissima</i>	1	Gravel
47a	-	-	Gravel
b	-	-	Gravel
48a	<i>Quadrula p. pustulosa</i>	1	Sand
b	-	-	Sand
49a	-	-	Sand
b	-	-	Sand
50a	-	-	Sand
b	-	-	Sand
TOTAL	9 Species	53 Individuals	

[†]Each sampling point, except for the first two, consisted of two adjacent ("a" and "b") 1-m² grids.

Table 3. Species of mussels collected only as dead or subfossil shells from the Rock River in the immediate vicinity of the Illinois Route 2 bridge south of Grand Detour in Lee and Ogle counties, Illinois, on 30 and 31 October 1985 and on 31 August 1986.

SPECIES

Actinonaias ligamentina (Lamark)

Amblyma plicata plicata (Say)

Cyclonaias tuberculata (Rafinesque)

Elliptio dilatata (Rafinesque)

Fusconaia flava (Rafinesque)

Pleurobema cordatum complex

DISCUSSION

Historical Distribution of Freshwater Mussels in the Rock River

Approximately 50 percent of the known species of freshwater mussels in the world occur in eastern North America (Stansbery 1970), achieving their greatest diversity in the Mississippi River basin (Johnson 1970). Significant depletions in both numbers of individuals and species during the last century have been documented for river systems such as the Kankakee (Suloway 1981); Vermilion (Matteson and Dexter 1966; Suloway 1975); Kaskaskia (Suloway, Suloway, and Herricks 1981); Illinois (Starrett 1971); Wabash and White in Indiana (Krumholz *et al.* 1970); Green, Tennessee, and Ohio (Stansbery 1964; Williams 1969); and Mississippi (Fuller 1978). Mussels in the Rock River likewise appear to have declined since the early 1900's.

Historical records indicate that the mussel fauna of the Rock River once was both abundant and diverse. Baker (1926) listed 29 species (not including those forms presently considered to be ecological variants, etc., rather than distinct species) as occurring in the Rock River in Illinois. Twenty-eight of these were collected from the stretch between the vicinity of Oregon (Ogle Co.) and Como (Whiteside Co.), a section which includes the present study area. *Lampsilis higginsii*, a federally listed endangered species, as well as *Ellipsaria lineolata* and *Plethobasus cyphus*, which presently are under consideration for listing as endangered or threatened in Illinois, were among the species recorded from this stretch of the river. The importance of Rock River mussels to the pearl button industry attests to their former abundance. Shells from the Rock River made up a significant portion of the total harvest for the manufacture of buttons early in this century (Coker 1919). Mr. Ralph Payne of Grand Detour, Illinois, a shell buyer from the 1920's through the early 1950's, stated that the vicinity of the study area (e.g., Grand Detour), in particular, contained some very productive beds (Miller 1972).

Although Parmalee (1967) did not comment upon the total mussel fauna of particular streams in his work on the mussels of Illinois, he did note the occurrence and/or particular abundance of certain species in such rivers as the Rock. For example, he indicated that *Elliptio dilatata*, *Lampsilis ventricosa*, and *Ligumia recta* were locally abundant in the Rock River. Data from Parmalee's statewide collection (which is deposited in the Illinois State Museum in Springfield) include Rock River records of *Ellipsaria lineolata* (Winnebago Co., 10 Nov. 1953), *Plethobasus cyphus* (Roscoe, Winnebago Co., 24 Aug. 1953), and *Lampsilis higginsii* (1.5 mi E. Milan, Rock Island Co., 12 July 1959). (It should be noted here that no indication was given as to whether the *L. higginsii* specimen was collected alive or as a dead or subfossil shell).

Miller (1972) conducted a mussel survey of the entire length of the Rock River in Illinois during 1969 and 1970. He sampled primarily using a crowfoot bar ("brail"), but also employed hand-picking where conditions were suitable. A total of 542 individuals representing 21 species was collected during Miller's survey, including one species (*Anodonta imbecillis*) which was not recorded by Baker (1926). Conspicuously absent from the list of the list of species collected in Miller's survey is *Elliptio dilatata*. Absent also are *Ellipsaria lineolata* and *Lampsilis higginsii*, although these species never were abundant in the Rock River. *Elliptio dilatata*, however, formerly was common and

locally abundant in the Rock River, as evidenced by records from the INHS Mollusk Collection, the information presented in Parmalee's (1967) report, and the observation by INHS personnel of large numbers of old shells of this species in the study area during the present survey. In view of its former abundance, the absence of *E. dilatata* from Miller's survey suggests that this species has been drastically reduced or possibly extirpated from the Rock River in Illinois by 1972.

Sixteen species of mussels were collected by Miller (1972) from the Rock River between Oregon and Como, a stretch that includes the present study area. He reported finding no large mussel beds below Oregon Dam. Miller's observations suggested that the greatest abundance of mussels was concentrated upstream from Oregon.

In response to a request from a fisherman to harvest Rock River mussels, the Illinois Department of Conservation (IDOC) conducted a survey in August 1981. The purpose of this survey was to determine whether or not a mussel population still existed in the upper reaches of the Rock River in Illinois, and, if so, to what extent this population could be harvested commercially. Twelve Rock River sites between the confluence of the Pecatonica River west of Rockton in Winnebago County and Byron in Ogle County were surveyed by IDOC personnel using a crowfoot bar. During their 2 day survey, IDOC personnel collected 303 live mussels representing eight species from the 12 sites. All species collected were common and widespread in Illinois, with the exception of *Ligumia recta*. None of the species collected currently is listed as federal or state endangered or threatened, nor is any under consideration for listing.

During July 1986, IDOC conducted another braill survey of the upper reaches of the Rock River. Approximately 30 sites between Rockton and Castle Rock State Park were surveyed. Although these data have not been compiled, Mr. Bill Fritz of the IDOC (pers. comm.) stated that all live mussels collected during the 1986 survey represented species common to the river; none were listed as federal or state endangered or threatened species, nor presently were under consideration for such listing. Pending compilation by IDOC, this information will be included in our report to IDOT discussing the distribution and abundance of Rock River and Rock River tributary mussels in the immediate vicinity of Castle Rock State Park (IDOT/FAP 742 Mussel Study Sites B & C, referred to previously in this report, and noted in Figure 1).

Eleven species of mussels were collected in the immediate vicinity of the Illinois Route 2 bridge during the present study. All of these were represented in Miller's (1972) study, the most recent comprehensive survey of the mussels of the Rock River. However, three of the species (*Anodonta imbecillis*, *Lampsilis radiata siliquioidea*, and *Potamilus laevis*) collected during the present study were not taken by Miller from the segment of the Rock River (Oregon to Como) that includes the present study area. A summary of the species collected by Baker (1926), Miller (1972), IDOC (1981, unpublished), and those collected during the present study in 1985 and 1986 is provided in Table 4.

Table 4. Mussel species recorded from the Rock River[†] during four surveys, including the present study. Data from Miller (1972), IDOC (1981, unpublished), and the present study represent only specimens collected alive.

	Baker (1926)		Miller (1972)		IDOC (1981)	Present Study
	Rock River	Oregon to Como only	Rock River	Oregon to Como only	Rockton to Byron	1985, 1986
<i>Actinonaias ligamentina</i> (Lamarck)	+	+	+	+	+	-
<i>Alasmidonta marginata</i> Say	+	+	+	+	+	-
<i>Amblema plicata plicata</i> (Say)	+	+	+	+	-	-
<i>Anodonta grandis</i> complex	+	+	+	+	-	+
<i>A. imbecillis</i> Say	-	-	+	-	+	+
<i>Cyclonaias tuberculata</i> (Rafinesque)	+	+	+	+	-	-
<i>Ellipsaria lineolata</i> (Rafinesque)	+	+	-	-	-	-
<i>Elliptio dilatata</i>	+	+	-	-	-	-
<i>Fusconaia ebena</i> (Lea)	+	+	-	-	-	-
<i>F. flava</i> (Rafinesque)	+	+	-	+	+	-
<i>Lampsilis higginsii</i> (Lea)	+	+	-	-	-	-
<i>L. radiata siliquoidea</i> (Barnes)	+	+	+	-	-	+
<i>L. teres</i> (Rafinesque)	+	+	-	-	-	-
<i>L. ventricosa</i> (Barnes)	+	+	+	+	+	+
<i>Lasmigona complanata</i> (Barnes)	+	+	+	+	-	+
<i>L. costata</i> (Rafinesque)	+	+	-	-	-	-
<i>Leptodea fragilis</i> (Rafinesque)	-	-	+	+	-	+
<i>Ligumia recta</i> (Lamarck)	+	+	+	+	+	+
<i>Obliquaria reflexa</i> Rafinesque	+	+	-	-	-	-
<i>Obovaria olivaria</i> (Rafinesque)	+	-	-	-	-	-

(Table 4 concluded on next page)

Table 4 (concluded).

	Baker (1926)		Miller (1972)		IDOC (1981)	Present Study 1985, 1986
	Rock River	Oregon to Como only	Rock River	Oregon to Como only	Rockton to Byron	
<i>Plethobasus cyphus</i> (Rafinesque)	+	+	+	-	-	-
<i>Pleurobema cordatum</i> complex	+	+	+	+	*	-
<i>Potamilus alatus</i> (Say)	+	+	-	-	-	-
<i>P. laevissima</i> (Lea)	- +	+	+	-	-	+
<i>Quadrula metanevra</i> (Rafinesque)	+	+	+	+	-	-
<i>Q. pustulosa pustulosa</i> (Lea)	+	+	+	+	+	+
<i>Strophitus undulatus</i> (Say)	+	+	+	+	+	+
<i>Toxolasma parvus</i> (Barnes)	+	+	+	-	-	-
<i>Tritogonia verrucosa</i> (Rafinesque)	+	+	+	-	-	-
<i>Truncilla donaciformis</i> (Lea)	+	+	+	+	-	+
<i>T. truncata</i> Rafinesque	+	+	+	+	-	-
Total Number of Species	29	28	20	16	8	11

† All collections discussed in Table 4 were taken from localities along the main channel of the Rock River.

* Identity of specimens not certain.

Endangered and Threatened Unionid Mussels in the Rock River

In response to the decline in mussel populations, federal and state governments have enacted legislation to protect several species. The federal government currently lists 22 species of mussels found in the United States as endangered (USDI 1984a). In addition, USDI (1984b) identified species of mussels which are being considered for addition to the List of Endangered and Threatened Wildlife. *Lampsilis higginsi*, a federally listed endangered species, was recorded from the Rock River by Baker (1926), but it has not been found during mussel surveys conducted since that time (see Table 4). Neither recently dead nor subfossil shells of *L. higginsi* were found during the present study.

Simpsonaias ambigua presently is being considered for federal listing as endangered or threatened under Category 2 (listing may be appropriate, but more information is needed). *Simpsonaias ambigua* has not been recorded from the Rock River, but we have considered it during the present study for the following reasons. First, the known range of *S. ambigua* probably is a minimal estimate of its actual distribution. This is because it typically is found in a restricted, cryptic microhabitat such as under large flat rocks, under deeply undercut bedrock ledges, or in bedrock cracks (Howard 1951; Clarke 1985; David Heath, pers. comm.) and is likely to be overlooked unless specifically sought. For example, our diver for this project, Mr. David Heath, has collected *S. ambigua* from the Wisconsin River in southern Wisconsin. He stated that after he collected the first live specimen of this species, additional individuals (including empty shells) were not found for 2 years, until the species' microhabitat was identified and located. Since that time, 41 living specimens positively identified (as well as 20 additional individuals tentatively identified underwater) have been collected from one Wisconsin River locality. Mr. Heath pointed out that such microhabitat is limited and often difficult to locate, but that many individuals may inhabit a single small area (e.g., he found 23 individuals in a 2 ft² area). Mr. Heath also noted that a mussel survey conducted during the 1970's at the same locality where he found *S. ambigua* failed to yield any individuals of this species. Thus, *S. ambigua* may occur in places from which it has not been recorded previously. It has been recorded from scattered locations elsewhere in Illinois (Baker 1906; Clarke 1985) and possibly may occur in the Rock River.

Another reason to suspect that *Simpsonaias ambigua* might occur (or might have occurred at some time in the past) in the Rock River is that the only known host for its glochidia - *Necturus maculosus maculosus* (Rafinesque), the mudpuppy - has been recorded from the Rock River and some of its tributaries (Smith 1961). Smith noted that this species is "statewide in distribution and probably abundant in suitable streams in every Illinois county, ...but it is difficult to collect by usual collecting methods". Smith examined specimens collected from the Rock River drainage in McHenry, Winnebago, and Rock Island counties, and noted records believed to be valid from the Rock and Green River drainages in Ogle and Lee counties, respectively.

Numerous small ledges and cracks in the bedrock outcrop, which seem to be the type of habitat where *Simpsonaias ambigua* and its host, the mudpuppy, are known to occur (Figure 2, area "S") were observed by our diver during October 1985. However, a thorough search of this area in August 1986 failed to yield any evidence to suggest that *S. ambigua* occurs or formerly occurred at this site. No mudpuppies were observed during our survey.

The Illinois list of endangered mussels presently includes only those species which already are protected as federally endangered species. However, INHS personnel recently (27 March 1985) proposed to the Illinois Endangered Species Protection Board a list of mussel species which are believed to be in danger of extirpation from Illinois. Baker's (1926) list (Table 4) includes two of these species, *Ellipsaria lineolata* and *Plethobasus cyphus*. Both species were recorded from the "Oregon to Como" stretch of the river. Miller (1972) collected *Plethobasus cyphus* during his study, although he did not find it in the stretch of river (Oregon to Como) which includes the present study area. Neither live specimens nor dead or subfossil shells of any proposed state threatened or endangered species were found during the present study.

SUMMARY

Data gathered during the present study indicate that a population of unionid mussels exists in the Rock River in the vicinity of the Illinois Route 2 bridge south of Grand Detour. However, this population does not appear large enough to be considered a significant bed. Quantitative sampling yielded 53 individuals representing nine species of mussels; two additional species were collected during qualitative sampling. None of these species presently is listed as federally endangered or threatened, nor is any under consideration for such listing. None of the species collected during the present survey has been proposed for listing as endangered or threatened in Illinois.

A bedrock outcrop which extends out from the south shoreline approximately 100 m upstream of the bridge (Figure 2, area "S") appeared to contain suitable habitat for *Simpsonaias ambigua*, a species currently under consideration for federal listing as endangered. A thorough search of this area, however, failed to produce any evidence to suggest that this species occurs presently or formerly occurred at this site.

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