

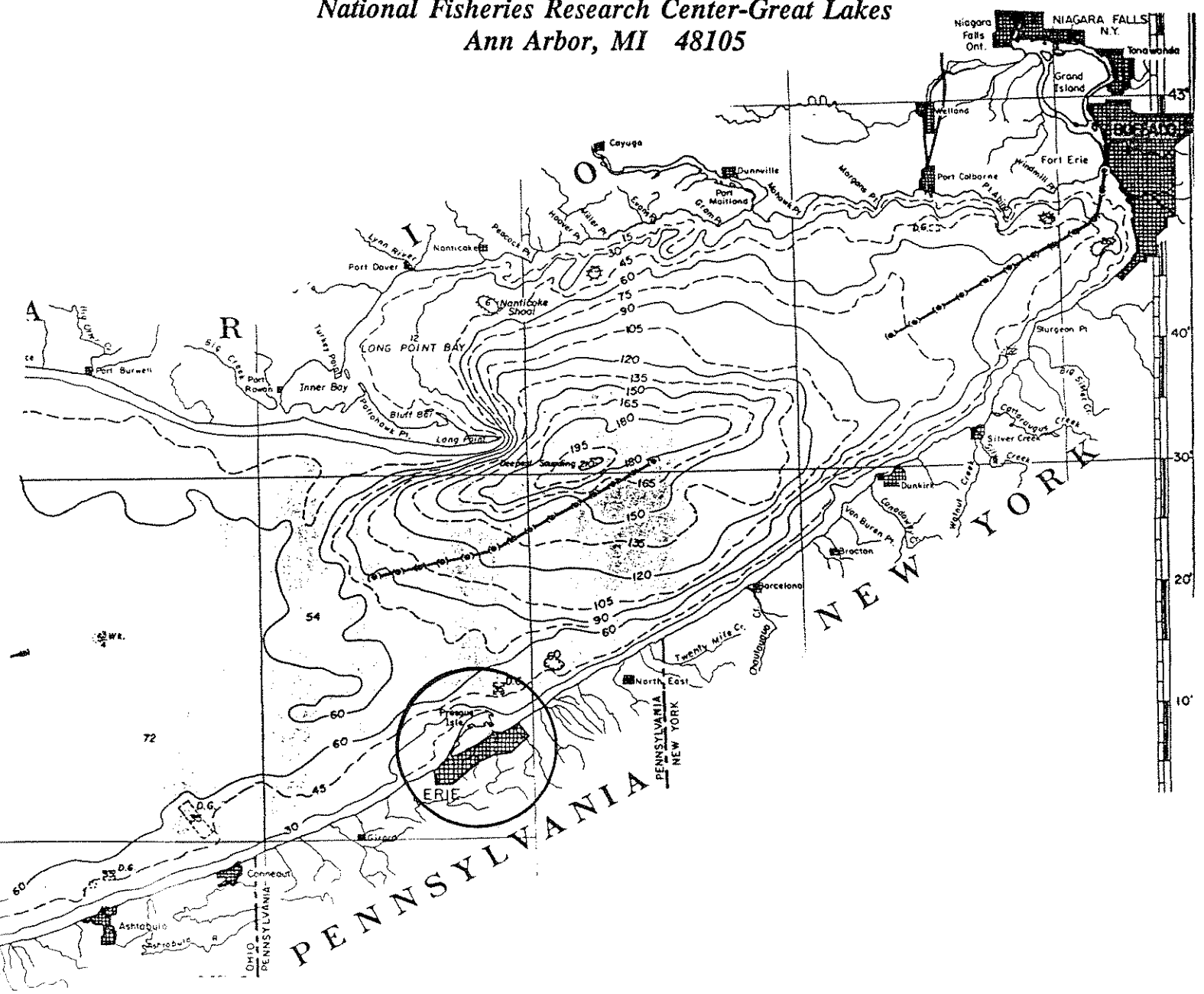
Masteller  
Schloesser  
1991

# Infestation and Impact of Zebra Mussels on the Native Population at Presque Isle State Park, Erie, PA

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## TABLE OF CONTENTS

- I. Zebra Mussel Interactions with Unionids in North America -  
Activities at Presque Isle, Erie, PA
- II. Site Locations at Presque Isle, Erie, PA
- III. Mollusca Beds at Presque Isle 1990-91 with species numbers
- IV. Mollusca collections from Presque Isle, Erie, PA
  - A. June, July, September 1990
  - B. July 1991
- V. Recaptures
- VI. Pelecypoda of Presque Isle, Erie, PA
- VII. Global and State Ranks - (Nature Conservancy)
- VIII. Mollusca Beds Presque Isle 1990-91 Collections
- IX. Unionidae Species, Numbers & Sizes with Zebra Mussels - 1990

*May 1990 - first period*

## ZEBRA MUSSEL INTERACTIONS WITH UNIONIDS IN NORTH AMERICA

### Activities at Presque Isle, Erie, PA

1. During the summer of 1990, zebra mussels became evident in the Erie area. A study was initiated to obtain baseline data on bioaccumulation of heavy metals in the soft tissue of zebra mussels. Fifteen samples were obtained between June through October and analyzed for cadmium, lead, chromium, and three samples for zinc. This amounted to over 64 grams of soft tissue that was analyzed. The calcium level in background water was also determined. Zebra mussel sizes ranged from 0.8 - 2.1 cm in length. The following results were obtained.

Cd - 2.8-10.1 average 5.3ppm  
Cr - 2.6-6.4 average 4.2ppm  
Pb - 2.6-9.4 average 7.4ppm  
Zn - 104-112 average 108ppm

*perg (initial)*

2. During June, July, and September of 1990, native unionid mussels were collected and the zebra mussels were removed, counted, and measured from a representative sample of unionids which were identified and then marked with an identification number on the shell, measured for length, width, and height and returned to the collecting site except for a few species which were used to verify identifications. Seventeen species were collected during these sampling efforts and 637 specimens were marked. During the June and July sampling, zebra mussels were only prevalent at site 1 (Thompson Bay at Presque Isle). By September 1990, sample zebra mussels were present at site 4 (West Fisher Drive). A total of 21 specimens were recaptured from earlier sampling. Don Schloesser assisted us in our efforts from September forward.
3. In July 1991, 17 species were again collected but differing from those of 1990 and a total of 485 unionid specimens were collected and marked. Sixteen of these were recaptured. Almost 100% of the unionids were infested with zebra mussels which made it difficult to obtain an accurate measurement of the unionid. The relative amount of zebra mussel coverage of the unionid shell was estimated. Dead shells were also collected at each site and identified. Four marked shells were recovered that were returned live to their habitat.  
During July 1991, we also made a video tape of zebra mussel veligers.
4. Currently, we are measuring zebra mussels from a representative removal from unionids. We are also planning to return for a third year of sampling in mid-July. We plan to add to our zebra mussel veliger tape with more veliger stages.

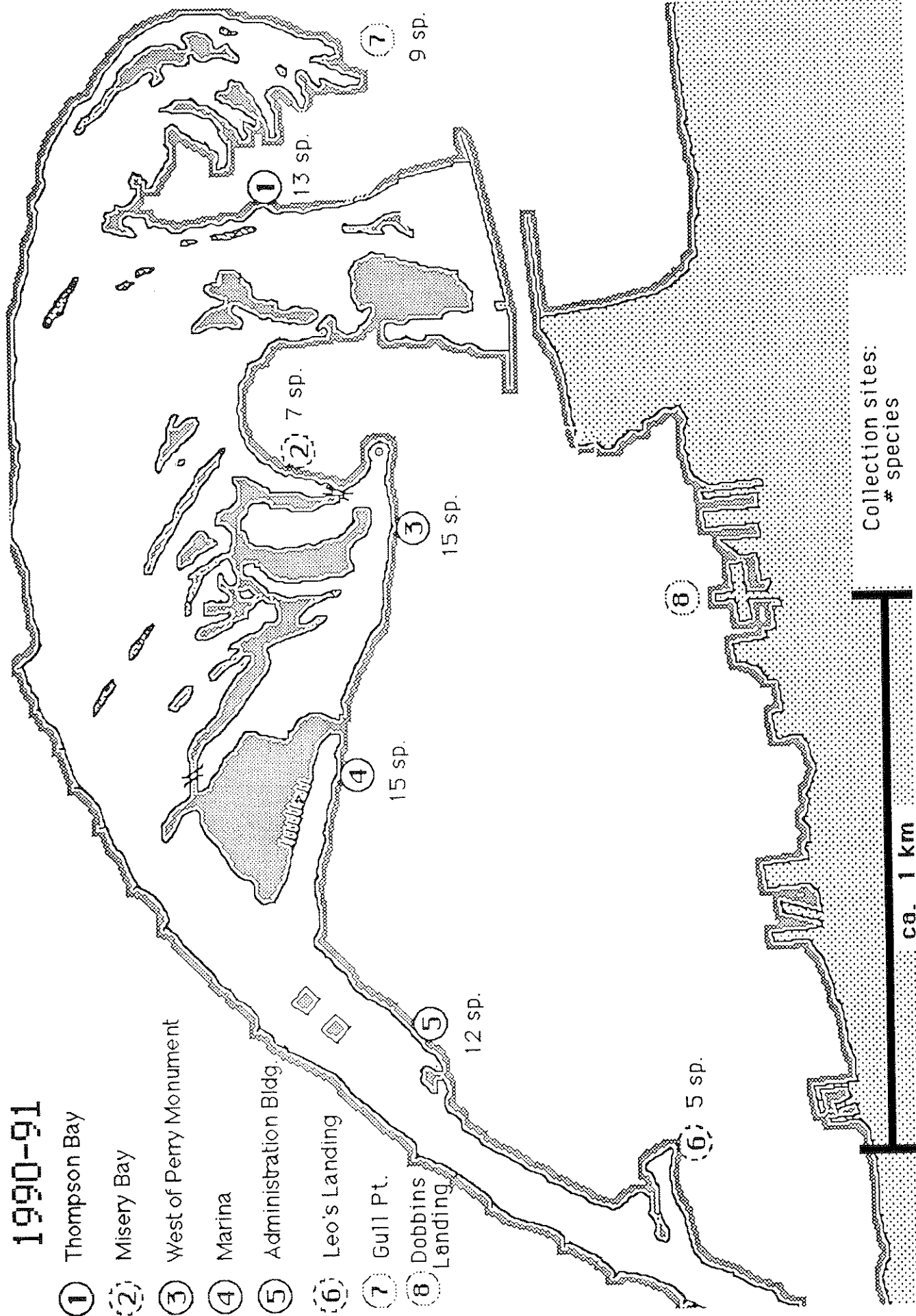
# **Site Locations**

- 1. Thompson Bay**
- 2. Misery Bay**
- 3. West of Perry Monument**
- 4. Fisher Drive across from Marina**
- 5. Behind Administration Building**
- 6. Leo's Landing**
- 7. Gull Point**
- 8. Dobbin's Landing**

# Mollusca Beds Presque Isle

1990-91

- ① Thompson Bay
- ② Misery Bay
- ③ West of Perry Monument
- ④ Marina
- ⑤ Administration Bldg
- ⑥ Leo's Landing
- ⑦ Gull Pt.
- ⑧ Dobbins Landing



**MOLLUSCA OF PRESQUE ISLE  
COLLECTIONS OF JUNE, JULY, SEPTEMBER 1990**

SPECIES (*endangered)	Site							
	6	5	4	3	2	8	1	7
<i>Amblema plicata</i>	2	6	6	21			5	x
* <i>Anodonta grandis</i>		2	9	29	6	2	40	x
<i>Elliptio dilatata</i>			7	6	5		3	x
* <i>Fusconaia flava</i>			14	4			16	x
<i>Lampsilis cardium</i>								x
<i>Lampsilis fasciola</i>			5					
<i>Lampsilis radiata</i>	2	3	139	17	4		34	xxx
<i>Lampsilis sp. 1</i>	12		5	3			1	
<i>Lampsilis sp. 2</i>			3					
* <i>Lampsilis ventricosa (=L. ovata)</i>		2	1	1	1	1	3	
<i>Lasmigona complanta</i>			1	3				
* <i>Leptodea fragilis</i>	5	6	27	9	1		47	x
<i>Ligumia nasuta</i>	1	4	1		1		1	x
* <i>Ligumia recta</i>		2		16			3	
* <i>Obliquaria reflexa</i>				1				
* <i>Potamilus alatus</i>		1	16	10	1		58	x
* <i>Quadrula quadrula</i>				2				
<b>Totals</b>	22	27	234	122	19	3	211	xxx

637

**MOLLUSCA OF PRESQUE ISLE  
COLLECTIONS OF JULY 1991**

<b>SPECIES (*endangered)</b>	<b>Site</b>			
	<b>5</b>	<b>4</b>	<b>3</b>	<b>1</b>
<i>Amblema plicata</i>	1	15	28	3
* <i>Anodonta grandis</i>		7	1	1
<i>Elliptio dilatata</i>	5	1	2	1
* <i>Fusconaia flava</i>	2	4	4	9
<i>Lampsilis radiata</i>	43	69	79	17
<i>Lampsilis sp. 1</i>	3	12	47	1
<i>Lampsilis sp. 2</i>	1	2	1	
* <i>Lampsilis ventricosa (=L. ovata)</i>	3	2	7	
<i>Lasmigona complanta</i>		1		
* <i>Leptodea fragilis</i>	4	24	31	14
<i>Ligumia nasuta</i>		3	1	1
* <i>Ligumia recta</i>		2		
* <i>Potamilus alatus</i>	2		15	16
<i>Quadrula pustulosa</i>			1	
* <i>Quadrula quadrula</i>			6	
<i>Strophitus undulatus</i>				1
<i>Truncilla truncata</i>	2	8	17	2
<b>TOTALS</b>	27	150	242	66

485

**RECAPTURED  
8 SEPTEMBER 1990**

SPECIES	Site		
	1	3	4
<i>Amblema plicata</i>	2		
<i>Anodonta grandis</i>	2	2	
<i>Fusconaia flava</i>			2
<i>Lampsilis siliquoidea</i>			9
<i>Potamilus alatus</i>	2	2	
<b>Totals</b>	6	4	11
			21

**RECAPTURED  
25-26 JULY 1991**

SPECIES	Site			
	1	3	4	5
<i>Amblema plicata</i>		2	1	
<i>Anodonta grandis</i>	1			
<i>Fusconaia flava</i>		1		
<i>Lampsilis siliquoidea</i>			1	4
<i>Leptodea fragilis</i>	1			
<i>Ligumia nasuta</i>				1
<i>Potamilus alatus</i>	3			
<i>Quadrula quadrula</i>		1		
<b>TOTALS</b>	5	4	2	5
				16



## PELECYPODA

### Unionidae

- Three-ridge - *Amblema plicata plicata* (Say)  
 Giant floater - *Anodonta grandis* Say  
 Paper pondshell - *A. imbecillis* Say  
 Cylindrical papershell - *Anodontooides ferrussacianus* (Lea)  
 Spike or false pig-toe - *Elliptio dilatatus* (Raf.)  
 Snuffbox - *Epioblasma triquetra* (Raf.)  
 Wabash pig-toe - *Fusconaia flava* (Raf.)  
 Plain pocketbook - *Lampsilis cardium* Raf.  
 Pocketbook - *L. ovata* (Say)  
 Eastern lampmussel - *L. radiata luteola* (Lamarck)  
 Fat mucket - *L. siliquoidea* (Barnes)  
 Yellow sandshell - *L. teres froma fallaciosa* (Smith)  
 Brook lasmigona - *Lasmigona compressa* (Lea)  
 Fluted shell - *Lasmigona costata* (Lea)  
 Fragile papershell - *Leptodea fragilis* (Raf.)  
 Eastern pondmussel or pointed sandshell - *Ligumia nasuta* (Say)  
 Black sandshell - *Ligumia recta* (Lamarck)  
 Threehorn wartyback - *Oblitquaria reflexa* (Raf.)  
 False pig-toe - *Pleurobema coccineum* (Conrad)  
 Pink heel-splitter - *Potamilus alatus* = *Proptera alata* (Say)  
 Kidneyshell - *Ptychobranchus fasciolaris* (Raf.)  
 Pimpleback - *Quadrula pustulosa pustulosa* (Say)  
 Mapleleaf - *Quadrula quadrula quadrula* (Raf.)  
 Squawfoot - *Strophitus undulatus* (Say)  
 Lilliput - *Toxoplasma parvus* (Barnes)  
 Deer-toe - *Truncilla truncata* (Raf.)  
 Fawnsfoot - *Truncillia donasiformes* (L. Lea)  
 Rainbow shell - *Villosa iris iris* (Lea)

(Global Rank = G; State Rank = S)

<i>Anodonta grandis</i> Say common floater	G 5	S U
<i>Q. quadrula</i> (Rafinesque) mapleleaf	G 5	S X
<i>Q. pustulosa</i> (Lea) pimpleback	G 5	S X
<i>Fusconia flava</i> (Rafinesque) Wabash pigtoe	G 5	S 2
<i>Leptodea fragilis</i> (Rafinesque) fragile papershell	G 5	S 1
<i>Obliquaria reflexa</i> Rafinesque three-horned wartyback	G 5	S X
<i>Potamilus alatus</i> (Say) pink heelsplitter	G 5	S 1
<i>Ligumia nasuta</i> (Say) Eastern pondmussel	G 4	S 1
<i>Lampsilis ovata</i> (Say) pocketbook	G 5	S 3
<i>Lasmigona complanata</i> Barnes white heelsplitter	G 5	S 1
<i>Epioblasma triquetra</i> (Rafinesque) snuffbox	G 4	S 2,1
<i>Truncillia denasiformes</i> (I. Lea) fawnsfoot	G 4	S 1
<i>Toxoplasma parvum</i> (Barnes) lilliput	G 4	S 1

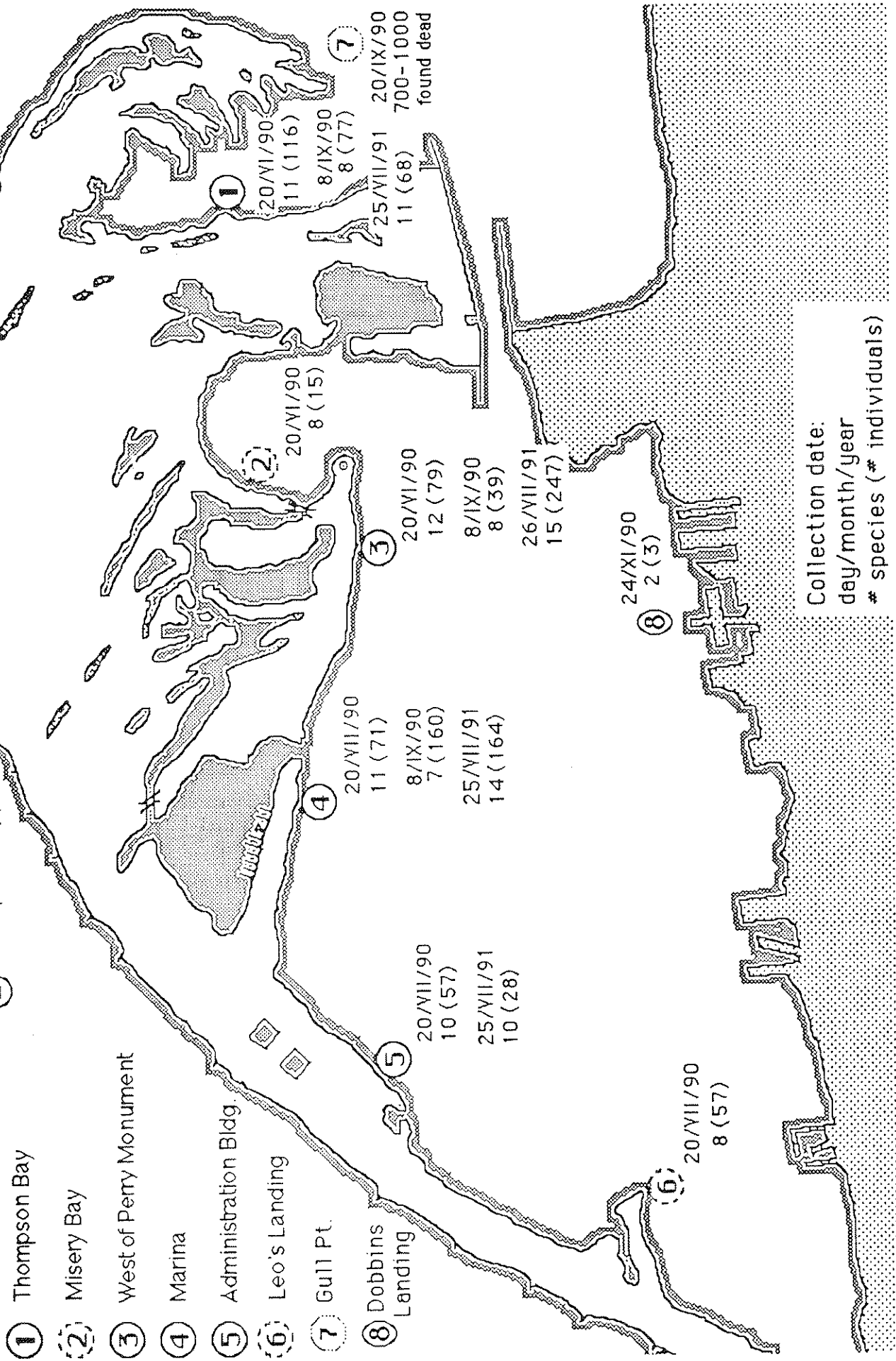
# Mollusca Beds Presque Isle

1990-91

- Dominant Species:
- ① *Potamilius alatus*  
(= *Proptera alata*)
  - ② *Elliptio* spp

- ③ *Anodonta grandis*
- ④ *Lampsilis siliquoidea*  
(= *L. radiata*)

- ⑤ *Lampsilis siliquoidea*  
(= *L. radiata*)
- ⑥ *Anodonta grandis*



Collection date:  
day/month/year  
# species (# individuals)

UNIONIDAE SPECIES, NUMBERS & SIZES WITH ZEBRA MUSSELS - 1990

	<u>number</u> <u>collected</u>	<u>av.cm</u> <u>length</u> <u>max./min</u>	<u>av.cm</u> <u>Height</u>	<u>av.cm</u> <u>width</u>	<u>number</u> <u>zebra</u> <u>mussels/clam</u>
<i>Lampsilis radiata</i>	94	7.75 10.34/ 5.10	4.54	3.41	66 (9) <i>had 20 mussels</i>
<i>Anodonta grandis</i>	60	7.21 12.28/ 2.40	4.25	3.02	86 (17)
<i>Proptera alata</i>	47	10.30 13.75/ 6.12	7.73	3.93	69 (23)
<i>Leptodea fragilis</i>	45	8.83 14.36/ 4.80	5.64	3.22	89 (14)
<i>Amblema plicata</i>	26	8.80 11.52/ 6.19	6.60	4.09	128 (5)
<i>Fusconaia flava</i>	21	6.02 9.96/ 4.00	4.26	2.90	50 (5)
<i>Anodontoides ferussaccianus</i>	16	10.66 11.73/ 8.96	5.87	4.31	0
<i>Elliptio dilatatus</i>	11	8.24 9.52/ 6.41	3.78	2.40	131 (1)
<i>Ligumia recta</i>	11	8.45 9.38/ 6.03	4.60	3.30	--- (0)
<i>Lampsilis ovata</i>	10	9.99 11.90/ 8.46	6.17	4.95	127 (6)
<i>Lampsilis siliquoidea</i>	9	7.08 9.60/ 5.80	4.17	3.14	0
<i>Ligumia nastua</i>	7	8.81 10.00/ 7.90	4.07	2.53	289 (1)

<i>Lampsilis fasciola</i>	7	8.65 9.06/ 7.65	4.74	3.55	0
<i>Strophitus undulatus</i>	6	9.29 10.51/ 7.33	5.02	4.07	58 (1)
<i>Lasmigona complanata</i>	4	12.69 14.90/ 11.40	8.76	4.76	1 (1)
<i>Quadrula quadrula</i>	1	7.79	5.84	3.73	0

