

**An examination of the Population Structure,
Community Relationships and Habitat
Characteristics for the Winged Mapleleaf
Mussel (*Quadrula fragosa*) at Interstate Park,
Saint Croix River, Wisconsin and Minnesota.**

by

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Introduction

Freshwater mussels (Family Unionidae) are widely distributed throughout the United States. There are 44 species of freshwater mussels currently on the federally endangered species list (Fish and Wildlife Service, 1991). Despite this fact, there is little known concerning the factors which control the distribution of these organisms, especially in flowing water systems. Certainly factors such as surface geology, stream size, water quality, substrate type, water flow, and food availability, among others, are important in determining the community structure and population dynamics of freshwater mussels (Strayer, 1983; Holland-Bartels, 1990).

In the past there have been studies on the unionids in the St. Croix River. Baker (1928) cited 15 species from the St. Croix River although he classifies some species as statewide. Dawley (1947) reported 29 species of unionids from the St. Croix River (in addition to 4 species found in tributaries to the St. Croix but not in the river proper). Fuller (1978) recorded 23 species of unionids from the St. Croix River at Hudson, WI. Stern (1983) reported 14 species of unionids from a single site on the St. Croix. Doolittle (1988) has conducted the most extensive study to date on the distribution of unionids in the St. Croix River. Thirty-seven species of unionids (including 2 only represented by dead shells) were reported by Doolittle in the river proper. Quantitative studies by Hornbach (1992) at Franconia, MN have indicated densities of 12 mussels/m² at that site. Semi-quantitative estimates by Doolittle (1988) gave ranges of 0.1 to 16.3 mussels/m² in established beds in the St. Croix.

Of particular interest in the St. Croix River is the presence of two species of endangered mussels, *Lampsilis higginsii* and *Quadrula fragosa*. *Lampsilis higginsii*, while found in the St. Croix, is also found throughout the Upper Mississippi River, albeit at low densities (Havlik, 1981; Holland-Bartels, 1990). The winged mapleleaf, *Quadrula fragosa*, previously distributed in 11 other states, is presently restricted to the St. Croix River (Fig. 1).

Due to the highly restricted nature of *Q. fragosa*, the major thrust of this research project was to investigate the factors which may influence the distribution and abundance of this endangered species. In addition, efforts

were made to characterize the mussel community associated with the presence or absence of *Q. fragosa*.

Material and Methods

Study Site

The study site was located on the St. Croix River at Taylor's Falls, MN, St. Croix Falls, WI at Interstate Park (Fig. 2). There is an extremely diverse and dense bed of mussels at this site (Doolittle, 1988). Heath and Miller (pers. comm.) have indicated that the greatest number of *Q. fragosa* in the St. Croix are found in this bed. This site is approximately 3.5 km downstream of an NSP hydroelectric dam. This is a peaking dam and thus greatly influences the daily flow regime at the sampling site. Figure 3 gives an example of the daily changes in flow that occurred just below the hydroelectric dam during January-October of 1992 (data from USGS gage 5-3405 at St. Croix Falls, WI.)

Mussel sampling

Mussels were collected by divers using SCUBA equipment. Fifteen sampling sites were established for quantitative sampling (Fig. 2). The sampling regime was set so that 5 sites (A-E) were arranged parallel to the flow of the river in the middle (M) and along the east (E) and west (W) shores of the river. The location of each site was recorded using a Magellan NAV-5000 Geographical Positioning System. At each of these sites a 2x5 m PVC grid was placed on the bottom of the river. Using this frame as a guide 10 0.25 m² quadrat samples were taken. All of the substrate within the 0.25 m² quadrat was removed and placed in a bucket. The contents were then sieved and any mussels > 0.5 mm were collected. Mussels were identified and their shell length (anterior-posterior dimension), width (lateral dimension) and height (dorsal-ventral dimension) was measured to the nearest 0.05 mm with a dial caliper. A number of studies have indicated that shell shape may vary along the length of a stream (e.g. Mackie and Topping, 1988). Therefore, since length alone is not a good indicator of age, we made the measurements of shell width and height.

To study changes in growth rate of mussels over time, we removed

samples of two common species (*Truncilla truncata* and *Fusconaia flava*) from the river in order to examine both external and internal shell growth rings. Since Neves and Moyer (1988) have indicated that in some species external growth rings are not an accurate measure of age, we took a representative size-range sample of mussels for these two species and examined their internal growth rings as a check on the external ageing method. This was accomplished by cutting the shell with a diamond saw from the umbo to the ventral margin and then sectioning the shell (Neves and Moyer, 1988). The length of the shell deposited each year was determined by measuring the distance between adjacent growth rings. This was accomplished by using a digitizing pad attached to a Macintosh II cx computer, and utilizing Image software developed by Wayne Rasband (National Institute of Mental Health).

At the location of the 10 subsamples taken at each site, the water depth was measured with a calibrated rod, and water flow at the bottom and 0.6 depth was taken with a Marsh-McBirney Model 201-D flow meter. The time at which these measurements were taken was recorded so that flow and depth could be correlated with discharge measurements from the USGS gage.

When the quadrat samples were taken to ascertain the population density of mussels, the buckets containing the mussels and substrate were sieved and the wet weight of the substrate retained in each of five sieves (65, 57, 12.7, 6.35 and 0.5 mm openings) was obtained. From the weights of these fractions the average particle size was determined (Lewis, 1984).

Water sampling

To determine the availability of nutrients to mussels water samples were taken from the river. Samples were taken at the sediment water interface and at 0.5 m above the bottom. PVC standpipes (2.54 cm in diameter) were attached to a cement block so that the openings of the pipes could be oriented upstream. One pipe allowed samples to be taken at the sediment-water interface, while the other allowed sampling of the water column 0.5 m above the bottom. These pipes were connected by garden hoses to diaphragm pumps which permitted samples of water to be pumped to the surface. The time at which these samples were taken was recorded to

allow for total suspended solids measurements to be adjusted for discharge.

The amount of suspended solids in the water samples was determined by APHA (1980) methods using Whatman AH934 glass fiber filters. Both the total suspended solids as dry weight and the organic fraction of the total suspended solids (assessed by loss on ignition) was determined.

*Additional sampling for *Quadrula fragosa**

Based on the 150 0.25 m² quadrats sampled, only 1 *Q. fragosa* was found (see results). In order to increase the number of samples in which we found *Q. fragosa*, divers were instructed to visually search specifically for the winged mapleleaf. Once a mussel was located, a float was placed to mark the exact location of the discovery. The location was then recorded with the GPS system and a 0.25 m² quadrat was taken so that the nature of the substrate and the mussel community in association with *Q. fragosa* could be determined. In addition, the water depth, flow and time when these measures was taken were recorded as noted above. A total of 36 diver-hours were spent in this additional searching.

Additionally data provided by David Heath and Glen Miller for *Q. fragosa* that they have collected in the St. Croix River, were used to examine the age structure of the winged mapleleaf population at Interstate Park.

Data were also obtained from the USGS to examine the historical trends in discharge at the Interstate site.

Statistical analyses

All statistical analyses were conducted with JMP Version 2.0 (SAS Institute, 1989) using a Macintosh II ci microcomputer or on a VAX 4000-400 using SAS (SAS Institute, 1982). Levels of statistical significance were assigned at the 0.05 level.

RESULTS AND DISCUSSION

Water Depth, Flow, Substrate and Total Suspended Solids Analyses

The exact locations of the sampling sites, the dates on which these sites were visited, and various habitat characteristics for each site are given in Table 1. There were significant differences in depth of the sites examined (Table 2). The river is fairly shallow along the east side of Folsom Island, where the majority of this study was conducted (Fig. 4A). The river is deeper at the upstream end of the island (sites AE, AM and AW). There is also a somewhat deeper channel along the most eastern shore. Water velocity [whether measured at the sediment water interface (Fig. 4B) or higher in the water column at the 0.6 depth (Fig. 4C)] varied significantly among sites examined (Table 1) and was greatest at the upstream end of the sampling site and along the east shore of this channel. However, these flow data must be examined carefully since the rates were measured at different discharge levels (Table 1). For example, at site CE the water depth and flow at the bottom and 0.6 depth and was measured on June 30, 1992 at 14:29 (UT), when the discharge was 1637.449 cfs. The depth was 0.23 m, the bottom flow was 0.30 m/s and the 0.6 flow was 0.52 m/s. At 15:40 UT on the same day (about an hour later) the depth had increased to 0.68 m, the bottom flow to 0.34 m/s, the 0.6 depth flow to 0.81 m/s and the discharge to 5210.075 cfs. Obviously there are great fluctuations in river discharge (218.6% increase in discharge) but interestingly with an almost 196% increase in depth and over a 56% increase in water velocity at the 0.6 depth, at the bottom, where mussels are found, the water velocity only increased about 13%. Once the hydrologic study that is currently being conducted by the Minnesota DNR at this site is completed, it should be possible to estimate the actual range of flows experienced by mussels at these locations.

Substrate composition was fairly similar throughout the study reach, though statistical analyses indicated there were significant differences among sites (Table 1- Fig. 5A). The most obvious variant is the somewhat finer-grained sediments found at site A. This is most likely due to the greater depth in the region resulting in a depositional area for finer sands. There was in fact a significant relationship ($F=24.17$, 1,149 df, $p<0.0001$) between water depth and the size of the sediment (Fig. 5B), with finer-

grained sediments being associated with deeper water.

Figures 6A and 6B show the amount of total suspended solids and the percent organic matter of the total suspended solids of water collected at 0.5 m above the bottom of the river. Figures 6C and 6D show similar measures for water taken at the sediment-water interface. It is apparent that there is variation among sites in both the total suspended solids and the organic content of these solids (see also Table 2). It is also obvious that there is a difference in the amount of total suspended solids in water collected at the sediment-water interface or above this interface. Generally there were greater amounts of suspended solids in the water collected at the sediment-water interface (least square means for total suspended solids as dry weight at the sediment water interface was 17.3 mg/L and only 11.3 mg/L for water taken 0.5 m above the bottom). An analysis of variance indicated that the difference in total suspended solids as dry weight between water collected at the sediment-water interface or above was not quite statistically significant ($F=2.9$, 1,89 df, $p=0.09$). We believe that the greater amount of suspended solids at the sediment-water interface is due to transport of materials along the bottom of the river. Much of the material in the suspended solids is inorganic in nature (low percent organic matter) and is probably fine sand (Hornbach, 1992). There was a significantly greater amount of total suspended solids as ash-free dry weight in water taken from the sediment water interface as compared to water taken 0.5 m above the bottom (least squares mean for sediment-water interface=3.15 mg/L and for 0.5 m above the bottom=2.17 mg/L; $F=5.72$, 1,89 df, $p=0.02$). This difference in the amount of total suspended solids as dry weight between water from the sediment-water interface and water taken above the bottom, coupled with the almost statistically significant difference in total suspended solids as dry weight, led to significant variations in the % organic matter in the suspended solids. The amount of organic matter significantly varied with the interaction between depth and location in the river, i.e. upstream-downstream and east to west ($F=1370$, 8,89 df, $p<0.01$). This significant interaction meant that depending on location in the river there may or may not be differences in the amount of organic content of the suspended solids in the water taken from the sediment-water interface or 0.5 above this interface. This variability is most likely due to variation in substrate type and flow which could lead to turbulence and the

resuspension of deposited sediments. There indeed was a significant relationship between the rate of flow at the 0.6 depth and the % organic matter in the suspended solids collected at the sediment-water interface ($F=8.33$, 1,12 df, $p=0.01$) and close to a significant relationship between the % organic matter and the flow at the bottom ($F=3.65$, 1,13 df, $p=0.08$). At higher rates of bottom flow there was a lowered percent of organic matter in the suspended solids collected from the bottom. For water taken from 0.5 m above the sediment-water interface there was a significant relationship between depth and % organic matter of the solids from this sample with water taken from shallower areas having a greater percent organic matter ($F=7.71$, 1,13 df, $p=0.02$). However, there were no significant relationships among water velocity or depth and other measures of suspended solids the amount of suspended solids or the percent organic matter of the suspended solids at the sediment water interface (*for water from the sediment-water interface*: total as dry weight vs depth, $F=0.52$, 1,13 df, $p=0.48$; total as ash-free dry weight vs depth, $F=0.002$, 1,13 df, $p=.97$; %organic matter vs depth, $F=1.78$, 1,13 df, $p=0.21$; total as dry weight vs bottom flow, $F=0.75$, 1,13 df, $p=0.40$; ash-free dry weight vs bottom flow, $F=0.23$, 1, 13 df $p=0.64$; total as dry weight vs 0.6 flow, $F=2.26$, df=1,12, $p=0.16$; total as ash-free dry weight vs 0.6 flow, $F=0.79$ 1,12 df, $p=0.39$; *for water from 0.5 m above the sediment-water interface*: total as dry weight vs depth, $F=2.36$, 1,13 df, $p=0.11$; total as ash-free dry weight vs depth, $F=0.68$, 1,13 df, $p=.43$; %organic matter vs depth, $F=1.78$, 1,13 df, $p=0.21$; total as dry weight vs bottom flow, $F=0.04$, 1,13 df, $p=0.85$; ash-free dry weight vs bottom flow, $F=0.02$, 1, 13 df $p=0.89$, % organic vs bottom flow $F=0.16$, 1,13 df, $p=0.69$; total as dry weight vs 0.6 flow, $F=.21$, df=1,12, $p=0.66$; total as ash-free dry weight, $F=0.79$ 1,12 df, $p=0.62$; % organic matter vs 0.6 flow, $F=1.52$, 1,12 df, $p=0.24$). Thus it appears that there is a greater amount of suspended materials at the sediment-water interface and that often this material is fin sand, especially in areas of greater depth and/or greater flow.

General Community and Population Structure

Based on the examination of over 1174 mussels in the 150 0.25 m², we found 29 species of mussels, including 1 specimen of the endangered species, *Quadrula fragosa* (Fig. 7 - Appendix 1). The deertoe, *Truncilla*

truncata dominated the community, comprising 58.5% of the mussels found. All other species comprised less than 10% of the individuals found.

Doolittle (1988) found 31 species of mussels at Taylor's Falls, MN. He gave *Fusconaia flava* and *Truncilla truncata* as the dominant species at this site. Doolittle (1988) showed that *Actinonaias ligamentina*, *Fusconaia flava*, *Elliptio dilatata*, *Amblema plicata* and *Lampsilis radiata* were the most common and abundant species found in the river as a whole. Also these species were often found associated with one another. He also noted, however, that less common species, such as *Truncilla truncata*, *Quadrula metanevra* and *Tritigonia verrucosa* are also found associated with one another. At Interstate Park, we found *T. truncata* as the dominant, with *T. donaciformes*, *A. carinata* and *Q. pustulosa* as abundant, subdominants. Thus at Interstate Park, there appears to be a unique mussel community composition when compared to other reaches of the St. Croix.

In Doolittle's (1988) study of the St. Croix River, the Interstate site harbored the most dense and diverse mussel community. Data from Hornbach (unpublished) supports this result. On average we found 3.25 species of mussels per 0.25 m² quadrat at the Interstate site. The mean mussel richness (number of species per quadrat) varied significantly with site of collection (Table 1 - Fig. 8A). The maximum number of species per quadrat was 10.

Doolittle (1988) collected two semi-quantitative samples from the Interstate site (his relative abundance samples). In one sample he found 3.73 mussels/m² and in the other, 16.3 mussels/m². These values are much lower than the overall average of 56.6 mussels/m² that we found. Part of the difference could be that we sieved the substrate for mussels while Doolittle only removed mussels from the river without sieving the substrate. There were significant influences of upstream/downstream location and relation to the shore (E,M,W) in mussel density (Table 1). The greatest density of mussels were found at the upstream end of the sampling site and along the eastern shore (Fig. 8B). The size of mussels found were not as influenced by location in the river (Table 1 - Fig. 8C), although there was a significant interaction between the upstream/downstream location and the relation to the shore (E,M,W).

We believe that much of the variability in mussel community richness, mussel density and size was due to differences in substrate type and water depth. We found a significant relationship between the community richness and sediment size ($F=10.22$, 1,149 df, $p=0.0001$; Fig. 9A) and between water depth and richness ($F=40.12$, 1,149 df, $p<0.0001$). Figure 10A shows that there was a significant increase in community richness with depth. Figure 9B shows the relationship between the mussel density and the average sediment particle size from each of the samples ($F=5.01$, 1,149 df, $p=0.02$). It is evident that mussel density was greatest in areas of finer substrate. A relationship between sediment size and mussel density was noted by Stern (1983) for sites in the St. Croix and Wisconsin rivers. He found the greatest density of mussels in areas where there was a mixture of sediment from mud through boulders (>64 mm), which would include the gravel substrate in which we found most of our mussels. Doolittle (1988) and Hornbach (1992) also found that the greatest percentage of mussels in the St. Croix River were found in sand/gravel and sand/rock or gravel/rock substrates. In areas with very fine sand (smaller than that found in this study), Hornbach (1992) and Stern (1988) found few mussels. At the other extreme, few mussels are generally associated with extremely large substrates (e.g. boulders), thus the Interstate site appears to represent a site with high quality substrate for mussel populations. Thin shelled species are often found in greater density in fine substrates (e.g. silt) [Ortmann's (1920) "Law of Stream Distribution" - see discussion in Mackie and Topping (1988)] but many of the species found at Interstate Park are thicker-shelled species. Mussel density was also significantly influenced by depth ($F=131.04$, 1,149 df, $p<0.0001$; Fig. 10B), with greater numbers of mussels being found in deeper areas of the river.

The average size of mussel collected was not significantly related to substrate size ($F=0.59$, 1, 149 df, $p=0.44$; Fig. 9C). Nor was there a significant relationship between mussel size and water depth ($F=1.34$, 1,149 df, $p=0.25$; Fig. 10C). It is interesting to note that while on average there was an increase in the average size of mussel collected with depth (Fig. 10C), the smallest mussels collected were only found in shallow areas.

One hypothesis for the significant relationship between sediment size and

density states that coarse substrates are indicative of stable habitats. These stable habitats are thus inhabited by greater numbers of mussels. One might also expect that there should have been significant relationships among sediment size and mussel community richness and average mussel size. This was true for community richness (Fig. 9B) but not for mussel size (Fig. 9C). Holland-Bartels (1990) and Duncan and Thiel (1983) however noted no difference in the community structure among different substrate types but did find that the abundance of mussels did vary among sediment types.

In this study, there were significant relationships among water depth and mussel density and community richness. Apparently, even if sediment texture is conducive to mussel habitation, the depth of water is more important in structuring mussel communities. The cause behind the relationship between water depth and increased mussel density and richness is not known. It is possible that higher summer temperatures in shallow water or ice scouring in the winter may be responsible for the noted distribution. It is also possible that differences in fish-host behavior accounts for the noted distribution. The fact that more juvenile mussels are found in shallow waters (Fig. 10C) even though density and richness is lower in these regions (Fig. 10A,B) may indicate that during the summer these shallower regions are able to be colonized by juvenile mussels, but during the winter either these juveniles die or migrate to deeper waters. Mussel migration deeper into the sediment during the winter has been documented (Amyot and Downing, 1991) but horizontal movements appear to be in response to lowering water levels and not cooler temperatures in the winter (van der Schalie, 1938).

A number of analyses were conducted to examine whether there was a relationship between the amount of suspended solids and the mussel population density or community richness. Few significant relationships were found (Table 3). This could partially be due to the fact that water samples were taken when water discharge varied greatly (Table 1). The two interesting significant relationships that were found included decreases in mussel density and mussel community richness at sites where there was high organic content of the suspended solids collected at 0.5 m above the bottom. Whether or not this is a cause-and-effect relationship or merely a coincidence is unknown. Since there was no

relationship between mussel density and community richness and the amount of organic matter in the suspended solids collected at the sediment-water interface, a cause-and-effect relationship with water collected 0.5 m above where the mussels are found seems doubtful.

Quadrula fragosa distribution at Interstate Park

As mentioned earlier, only 1 *Q. fragosa* was found among the 150 quantitative quadrats taken. Because of the lack of specimens, additional searches were undertaken for *Q. fragosa*. An additional 10 *Q. fragosa* were found (Table 4). The majority of the *Q. fragosa* found were taken from between 0.5 and 1.6 m. These mussels were taken from the upstream end of the bed at the level of the B sites (including BW and BM) and along the eastern shore (especially near sites BE through DE). The other mussels found in conjunction with *Q. fragosa* were quantified (Table 4). The mussel community found in conjunction with *Q. fragosa* was similar to that found in the 150 quantitative quadrats (Fig. 11). A LogLikelihood analysis indicated that in fact there was no significant difference in community structure ($X^2= 31.3$ df=1,1266, $p=0.26$) between samples with and without *Q. fragosa*.

Making other comparisons of the community data between quadrats with and without *Q. fragosa* indicated there were significant differences in mussel density ($t=2.07$, 159 df, $p=0.04$; Fig. 12A), mussel community richness ($t= 3.70$, 159 df, $p=0.0003$; Fig. 12B) and in the sizes of mussels collected ($t=3.09$, 1295 df, $p=0.002$; Fig. 13A). Even when examining a single species, e.g. *Truncilla truncata*, larger specimens of this species were found associated with *Q. fragosa* than without *Q. fragosa* ($t=2.12$, 762 df, $p=0.03$; Fig. 13B). All of these differences indicate that *Q. fragosa* is found in high quality mussel habitat. That is, *Q. fragosa* is found in locations of high species richness and mussel density and in areas where mussels can live to an old age (greater size).

Habitat characteristics of quadrats with and without *Q. fragosa* were also made. Figure 14A shows that there were no significant differences in the size of substrate in quadrats with and without *Q. fragosa* ($t=0.25$, 159 df, $p=0.80$). This similarity was confirmed by examining the percent of substrate found in each size category of substrate measured (Table 5).

There also were no significant differences in depth between quadrats with and without *Q. fragosa* ($t=0.81$, 159 df, $p=0.42$; Fig. 14B). There were, however, differences in the flow both at the bottom ($t=2.36$, 154 df, $p=0.02$) and at the 0.6 depth ($t=1.94$, 149 df, $p=0.05$) between quadrats with and without *Q. fragosa* (Figs. 14C and 14D). These differences must be carefully examined since discharge levels varied during the sampling period (Table 4). However, as mentioned earlier, even when depth varied by over 150% at one site, the bottom velocity only varied by 13%. This may indicate that the differences noted in bottom water velocity in quadrats with and without *Q. fragosa* may indeed be significant and important.

Figure 15 shows the number of *Q. fragosa* born in varying years at Interstate Park, based on data provided by Glen Miller and David Heath (pers. comm.) and from the *Q. fragosa* collected in this study (Table 6). The age of birth was estimated by back-calculation from counting growth rings. The greatest number of individuals collected at Interstate Park were born in 1984, with fewer numbers of mussels born in other years. Figure 16 shows the relationship between age and shell-length for the *Q. fragosa* collected at Interstate Park. As expected, growth decreases with age and thus the maximum shell length reaches an asymptotic value. While there were insufficient numbers to conduct a meaningful statistical analysis, it is interesting to note that there is a great deal of variation in shell length for mussels of the same age (Fig. 16). This variation is not necessarily dependant on the year in which the mussels were born. For example, 5 year old mussels born in 1984 varied in length from about 30 to over 80 mm. The cause of this great degree of variation is unknown. Even if the example just given is an extreme example, there appears to be, at a minimum, a range of at least 10 mm in size for mussels of the same age (Fig. 16). It is clear, however, that this variation in length does not result from varying shell shape, for there is a very tight relationship between shell length and shell height (Fig. 17; shell height = $5.73 + 0.80 \times$ shell length; $r^2=0.97$, $F=2696$, 1,75 df, $p<0.0001$). Consequently mussels which show greater shell lengths are likely to have total greater biomass than mussels with smaller shell lengths.

To examine whether there were significant changes in mussel growth with time for other species of mussels at Interstate Park, we aged 27 *Truncilla*

truncata and 13 *Fusconaia flava*, other important members of the mussel community (Fig. 7). As expected, shell growth decreased with age for both species of mussels (Fig. 18). Utilizing analyses of covariance, with shell length increase in a given year as the dependant variable, year as the independent variable, age as the covariable, and allowing for heterogeneity of slopes (age*year), we were able to examine whether there were differences in growth (increase in shell length) among years, when adjusted for the age of the mussel. Figure 19A shows that for *Truncilla truncata* there were significant differences in growth rates among years ($F=3.79$, 8,109 df, $p=0.001$), with especially reduced growth in 1984 and 1985. Both of these values are, however, based on the examination of only 5 mussels and must be interpreted with caution. For *F. flava* most of the mussels examined were fairly young and we could only reliably examine past growth for the years 1988 -1991 (Fig. 19B). There was no significant difference in growth rates among these years ($F=1.01$, 3,46 df, $p=0.39$). Apparently throughout the period 1985-1992 few *Q. fragosa* were born, however growth rates for other species of mussels did not seem to be significantly lower that for other years. Thus the reason for the lack of apparent recruitment for *Q. fragosa* is not displayed in other mussel species. It is possible that the factors that resulted in reduced recruitment may not have expressed themselves in the growth rates of other species. For example there could have be a reduced availability of fish host for *Q. fragosa* in the late 1980s, and this would not necessarily impact the growth rates of other species.

Historic patterns of Discharge at Interstate Park

There has been concern that changes in discharge patterns at Interstate Park may be partially responsible for changes in the relative abundance of *Q. fragosa* . Fortunately there is a good database available to examine changes in discharge over time at Interstate Park. Figure 20 shows the mean daily discharge levels for 1902-1991. The lack of data for the July 1905-Dec 1909 is due to construction of the dam which has been functioning continuously since 1908. In the period 1902-June 1905 the average discharge was 4961 cfs (range 251-23600) while for the period 1910-1942 the average discharge was 3339 cfs (range 75-35800) and for the period 1943-1991 the average discharge was 4875 cfs (range 296-53900). Figure 21 shows the average monthly discharge over the period

1902-1991. From this figure it is apparent that there is a strong seasonal change in discharge, with discharge levels greatest during the spring and summer. From these monthly means, the deviation that each daily discharge level deviated from its long-term monthly mean was calculated. Figure 22 shows the deviation from the monthly means. This graph accentuates that part of the reason for the low average in the 1910-1942 period was the low flow during the dust-bowl period of the late 1930s (Fig. 22). Also there was a period in the late 1980s of low water levels. Unfortunately there is no historical data on the relative abundance of *Q. fragosa* in the St. Croix River and thus we do not know whether the present levels of the winged mapleleaf found in the river are representative of historic levels.

Fuller (1974) points out that waterways below dams will occasionally dry out and that most mussels experience difficulty in escaping the consequences of falling waters. Some species are apparently able to withstand desiccation for short periods of time, but long periods of exposure are lethal. Fuller (1974) also states that some species of the mobile Lampsilinae are capable of moving to deeper areas as water levels fall, but heavier-shelled forms must be resistant to desiccation in order to survive. *Q. fragosa* is a heavier-shelled mussel and thus the likelihood that it will be able to escape low-water situations is poor. There has been some concern that low water levels, especially in the winter could reduce the number of *Q. fragosa* in the St. Croix. In the winter it is hypothesized that under low flow conditions, ice scour could reduce the number of *Q. fragosa*. Little work has been conducted on the impact of ice scouring on mussels communities. Van der Schalie (1938) claims that there is no movement to deeper waters in winter. Both he and Amyot and Downing (1991) indicate that the major response to cooler temperatures is for mussels to burrow deeper in the sediments. Both of their studies, however, dealt with thin-shelled forms inhabiting lake systems with fairly fine sediments. The probability that a thick-shelled form like *Q. fragosa* burrowing into the fairly coarse sediments found in the St. Croix is most likely low.

To examine whether there is a relationship between the relative abundance of various cohorts of *Q. fragosa* and low flow years we calculated the number of days that the discharge in the river was below

2000 cfs and what proportion of those days were in November-February (when ice could be found) versus the rest of the year (Fig. 23). There are historically a large number of years when a significant number of days have mean flows below 2000 cfs. Figure 24 shows the period 1967- 1991, for which we have records for births of *Q. fragosa* (Fig. 15). It is apparent that in the years 1976, 1988 and 1989 there were a fairly large number of days with flows below 2000 cfs. When comparing these low water years with the years of birth (Fig. 15) it is obvious that there is not a one-to-one correspondence between years of low water and reductions in *Q. fragosa* births, although large numbers of *Q. fragosa* born in 1978, 1979 and 1984 do correspond to years with few days with discharges <2000 cfs.

Despite, this lack of one-to-one correspondence between low water years and low levels of birth for *Q. fragosa*, it is still possible that varying water depth does have a significant impact on the number of *Q. fragosa* found. For example, as mentioned above *Q. fragosa* is only found in areas of high quality mussel habitat. That is, *Q. fragosa* is found only where there are high densities of mussels (Fig. 12A) and where there is high mussel community richness (Fig. 12B). Figures 10A and 10B show that mussel communities in general are more dense and rich in areas of deeper water. Doolittle (1988) also state that the greatest number of mussels were collected in water around 2 m depth throughout the St. Croix. And as shown in Figure 11, since there is no difference in mussel communities with and without *Q. fragosa*, one might expect if water depth was somewhat deeper on average, they may be greater potential habitat for *Q. fragosa* at Interstate Park.

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Table 1. Locations of sampling sites at Interstate Park, and physical characteristics of these sites at the time of sampling.

SITE	LATITUDE	LONGITUDE	DATE	Average Depth (m)	Average Bottom Flow (m/s)	Average 0.6 Flow (m/s)	TIME (UT)	USGS Discharge Gage Height (ft)	Discharge based on gage height (cfs)
AW	45°23.87	92°39.56	7/1/92	2.50	0.167	0.403	14:05	4.08	5180.842
AM	45°23.74	92°39.59	6/24/92	2.50	0.139	0.371	14:46	3.82	4430.015
AE	45°23.70	92°39.53	6/24/92	1.60	0.203	0.403	18:31	4.37	6062.219
BW	45°23.74	92°39.62	6/18/92	0.70	0.339	0.663	14:29	3.71	4127.117
BM	45°23.77	92°39.59	6/19/92	0.66	0.308	0.598	16:38	3.81	4402.017
BE	45°23.66	92°39.63	6/30/92	0.94	0.280	0.672	16:25	4.09	5210.075
CW	45°23.64	92°39.76	6/17/92	0.74	0.139	0.288	14:38	4.42	6221.245
CM	45°23.70	92°39.88	6/17/92	0.48	0.194	0.384	15:58	3.22	2853.310
CE	45°23.62	92°39.71	6/30/92	0.23	0.302	0.515	14:29	2.64	1637.449
DW	45°23.58	92°39.82	6/9/92	0.25	0.057	0.125	14:23	2.61	1584.785
DM	45°23.59	92°32.79	6/4/92	0.54	0.088	0.123	15:02	2.64	1637.449
DE	45°23.60	92°39.76	6/25/92	1.60	0.210	0.529	15:24	4.10	5239.394
EW	45°23.54	92°39.97	6/23/92	0.60	0.241	0.602	18:38	4.38	6093.855
EM	45°23.54	92°39.92	6/23/92	1.27	0.231	N/A	15:45	3.86	4542.956
EE	45°23.52	92°39.91	6/25/92	1.60	0.197	0.507	20:10	4.37	6062.219

Table 2. F-values from analyses of variance with various habitat and community parameters as dependent variables and the location in the stream (upstream-downstream, east/west/middle location and their interaction) as independent variables. In all cases (except where noted) the F-values given are statistically significant at the 0.05 level.

INDEPENDENT VARIABLES	DEPENDENT VARIABLES										
	Depth ¹	Sediment size ¹	Bottom flow ¹	0.6 depth flow ¹	Total suspended solids - 0.5 m above the bottom ²	% Organic matter in TSS- 0.5 m above the bottom ²	Total suspended solids - at the sediment water interface ²	% Organic matter in TSS- at the sediment water interface ²	Richness ¹	Density ¹	Shell Length ¹
upstream-downstream	12760.2	12.61	93.96	536.42	1.6*	4.37	0.6*	13.27	8.98	33.95	1.38*
east/west/middle	671.2	8.18	24.32	205.39	0.19*	7.05	2.67*	10.69	20.97	27.87	1.90*
Interaction	2496.2	36.1	18.82	95.51	1.01*	3.98	0.66*	12.77	8.63	13.19	3.13†

¹ degrees of freedom - upstream-downstream 4, 149; east/middle/west 2, 149; Interaction 8, 149.

² degrees of freedom - upstream-downstream 4, 44; east/middle/west 2, 44; Interaction 8, 44.

* not significant at the 0.05 level

† degrees of freedom for interaction term 7, 149. Since no mussels were found at site EW, tests of significance are difficult to ascertain. The interaction term was significant while the main effects were not statistically significant.

Table 3. F-values for the relationship between various measures of the amount of suspended solids in the water column and mussel density, mussel community richness and mussel shell length. All values are not statistically significant unless otherwise indicated.

DEPENDENT VARIABLES	INDEPENDENT VARIABLES					
	Total suspended solids as dry weight - 0.5 m above the bottom ¹	total suspended solids as ash-free dry weight - 0.5 m above the bottom ¹	% organic matter of suspended solids - 0.5 m above the bottom ¹	Total suspended solids as dry weight- at the bottom ²	total suspended solids as ash-free dry weight - at the bottom ²	% organic matter of suspended solids - at the bottom ²
Mussel Density	3.17	0.34	8.89*	0.48	0.63	0.38
Mussel Community Richness	2.39	0.03	5.99*	1.46	4.21	0.17
Mussel Size	0.28	0.95	0.39	0.27	4.91*	0.23

¹ 1, 41 df

² 1, 44 df

* indicates statistically significant at the 0.05 level.

Table 4. Collection data for the 10 *Quadrula fragosa* found in searches made specifically for this species.

DATE	Latitude	Longitude	TIME	DISCHARGE (CFS)	DEPTH (m)	BOTTOM FLOW (m/s)	0.6 DEPTH FLOW (m/s)	AGE (yr)	YEAR OF BIRTH	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	NUMBER OF SPECIES FOUND ASSOCIATED WITH Q. FRAGOSA	TOTAL DENSITY OF MUSSELS FOUND WITH Q. FRAGOSA INCLUDING Q. FRAGOSA	SPECIES FOUND IN ASSOCIATION WITH Q. FRAGOSA ¹	MEAN SEDIMENT SIZE (φ)
6/9/92	45°23.59N	92°39.18W	16:23 UT	3026	0.62	0.14	0.23	13	1979	73.33	44.45	66.15	4	28	ED, QM, 3TT	-2.71
6/30/92	45°23.66N	92°39.53W	18:14 UT	5210	1.24	0.16	0.33	15	1977	71.2	4.2	68	6	28	AC, TV, 2TT, TD, CP	-3.23
7/1/92	45°23.72N	92°39.65W	18:24 UT	5327	1.6	0.12	0.36	16	1976	74.5	42.55	70.35	5	64	OR, AC, 2GT, 1TT	-3.18
7/1/92	45°23.72N	92°39.65W	18:43 UT	5327	1.6	0.15	0.39	12	1980	70.05	38.1	64.55	4	54	2TD, 2GP, 1TT	-2.46
7/11/92	45°23.72N	92°39.59W	18:38 UT	6370	0.6	0.04	0.16	9	1983	69	89.89	83.3	9	52	AC, AM, TV, LF, AP, TD, LR, 5TT	-2.57
8/13/92	45°23.82N	92°39.70W	17:49 UT	3153	0.82	*	*	5	1987	34.9	22.65	32.45	6	36	2QM, 2TT, 2TD, FF, CP	-1.57
8/20/92	*	*	14:53 UT	*	0.6	*	*	3	1989	17.15	10.7	15.05	6	48	7TT, TD, AC, EL, PS	-2.41
8/20/92	45°23.70N	92°39.58W	15:51 UT	*	0.86	*	*	6	1986	44.85	26.75	40.15	5	40	8TT, TD, QM, TV	-2.60
8/20/92	45°23.72N	92°39.58W	17:31 UT	*	0.82	*	*	5	1987	36.7	2.3	34.15	6	64	200, 2TV, 9TT, TD, OR	-2.79
8/20/92	45°23.64N	92°39.57W	18:33 UT	*	0.64	*	*	6	1986	55.55	33.95	53.95	4	60	12TT, EL, TD	-3.12

¹ see Figure 11 for species designations

* missing data

Table 5. Substrate comparisons among quadrats with and without *Quadrula fragosa*.

Sieve size (mm)	Quadrats with <i>Q. fragosa</i>		Quadrats without <i>Q. fragosa</i>	
	Mean percentage of sediment wet weight	Standard deviation of sediment wet weight	Mean percentage of sediment wet weight	Standard deviation of sediment wet weight
65	0.65	2.15	0.73	5.09
57	5.75	4.04	4.59	5.18
12.7	42.44	15.60	39.77	12.12
6.35	11.62	3.71	16.64	5.26
0.5	39.55	17.63	38.26	14.76

Table 6 - Information on *Quadrula fragosa* collected at Interstate Park.

Year of collection	Year of Birth	Age when collected	Shell length (mm)	Shell height (mm)	Source of data
1989	1967	22	83	71	Miller/Heath†
1988	1968	20	78	70	Miller/Heath†
1988	1968	20	82	72	Miller/Heath†
1988	1968	20	91	76	Miller/Heath†
1989	1968	21	74	65	Miller/Heath†
1989	1969	20	79	69	Miller/Heath†
1989	1971	18	73	62	Miller/Heath†
1991	1973	18	91	73	Miller/Heath†
1991	1973	18	96	80	Miller/Heath†
1989	1975	14	90	72	Miller/Heath†
1991	1976	15	74	68	Miller/Heath†
1992	1976	16	75	70	This study
1989	1977	12	83	71	Miller/Heath†
1992	1977	15	71	68	This study
1988	1978	10	55	58	Miller/Heath†
1988	1978	10	73	64	Miller/Heath†
1989	1978	11	69	63	Miller/Heath†
1989	1978	11	69	64	Miller/Heath†
1989	1978	11	71	63	Miller/Heath†
1991	1978	13	67	58	Miller/Heath†
1991	1978	13	68	61	Miller/Heath†
1991	1978	13	70	61	Miller/Heath†
1991	1978	13	73	63	Miller/Heath†
1988	1979	9	58	57	Miller/Heath†
1988	1979	9	70	62	Miller/Heath†
1989	1979	10	57	52	Miller/Heath†
1989	1979	10	58	54	Miller/Heath†
1989	1979	10	67	58	Miller/Heath†
1989	1979	10	72	65	Miller/Heath†
1989	1979	10	73	62	Miller/Heath†
1989	1979	10	83	71	Miller/Heath†
1989	1979	10	83	68	Miller/Heath†
1991	1979	12	60	55	Miller/Heath†
1992	1979	13	73	68	This study
1988	1980	8	60	55	Miller/Heath†
1989	1980	9	83	71	Miller/Heath†
1992	1980	12	70	65	This study
1992	1980	12	72	66	This study
1989	1981	8	58	54	Miller/Heath†
1989	1981	8	60	54	Miller/Heath†
1990	1981	9	71	63	Miller/Heath†
1991	1981	10	54	50	Miller/Heath†

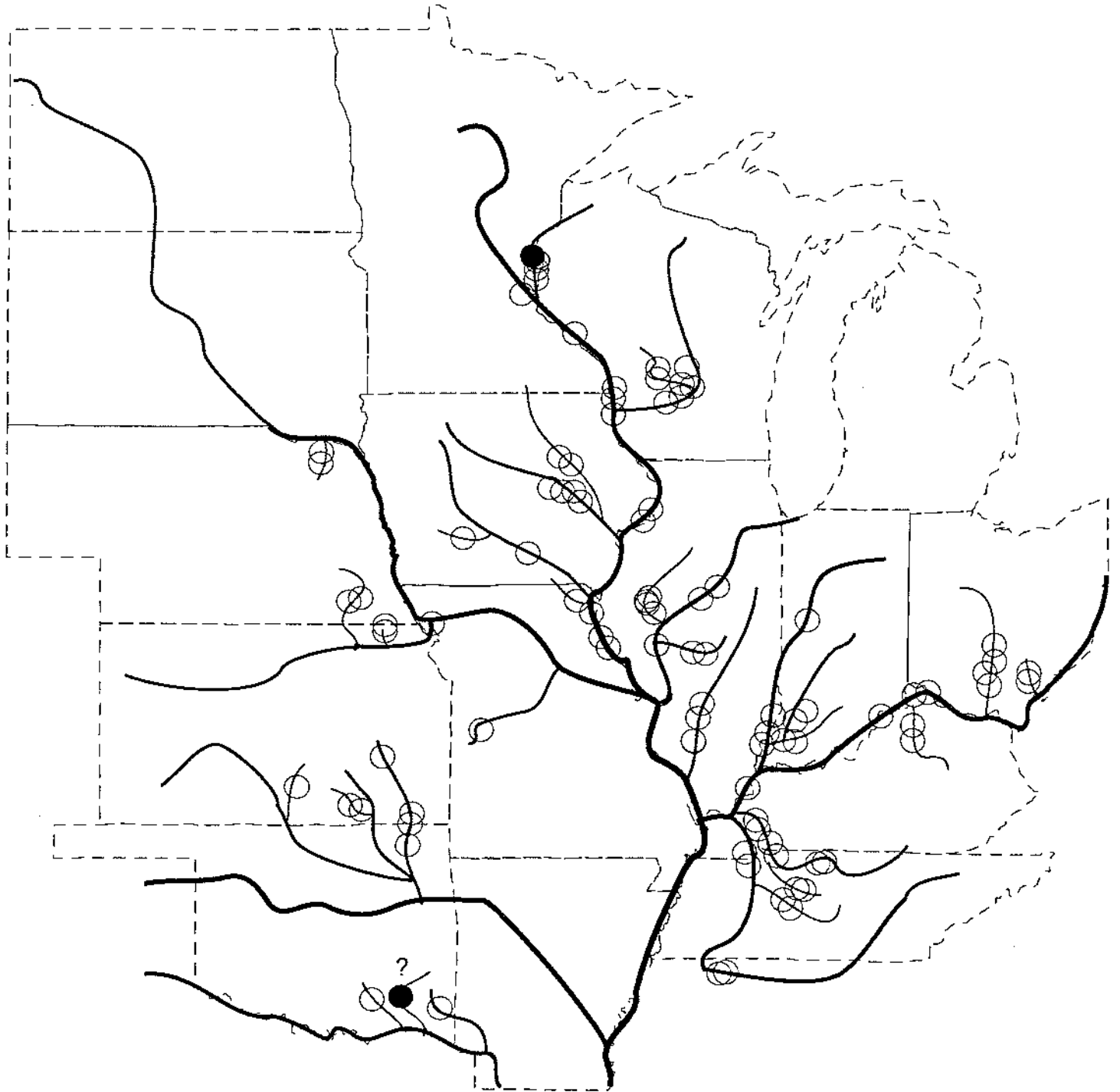
Table 6 - Information on *Quadrula fragosa* collected at Interstate Park.

Year of collection	Year of Birth	Age when collected	Shell length (mm)	Shell height (mm)	Source of data
1989	1982	7	51	47	Miller/Heath†
1991	1982	9	54	50	Miller/Heath†
1988	1983	5	44	40	Miller/Heath†
1990	1983	7	54	51	Miller/Heath†
1992	1983	9	69	62	This study
1988	1984	4	29	28	Miller/Heath†
1988	1984	4	35	35	Miller/Heath†
1988	1984	4	36	34	Miller/Heath†
1989	1984	5	31	30	Miller/Heath†
1989	1984	5	37	34	Miller/Heath†
1989	1984	5	38	37	Miller/Heath†
1989	1984	5	39	37	Miller/Heath†
1989	1984	5	40	37	Miller/Heath†
1989	1984	5	40	38	Miller/Heath†
1989	1984	5	44	41	Miller/Heath†
1989	1984	5	44	40	Miller/Heath†
1989	1984	5	45	42	Miller/Heath†
1989	1984	5	46	41	Miller/Heath†
1989	1984	5	46	45	Miller/Heath†
1989	1984	5	46	44	Miller/Heath†
1989	1984	5	48	45	Miller/Heath†
1989	1984	5	83	71	Miller/Heath†
1989	1984	5	83	71	Miller/Heath†
1989	1984	5	83	71	Miller/Heath†
1990	1984	6	40	38	Miller/Heath†
1990	1984	6	51	47	Miller/Heath†
1990	1984	6	54	50	Miller/Heath†
1990	1985	5	38	34	Miller/Heath†
1992	1986	6	45	40	This study
1992	1986	6	56	54	This study
1991	1987	4	19	14	Hornbach, 1992
1992	1987	5	35	32	This study
1992	1987	5	37	34	This study
1992	1989	3	17	15	This study
†reported in draft <i>Q. fragosa</i> recovery plan					

Quadrula fragosa distribution.

- Pre-1930 and recent subfossil records
- Recent (1931-1991) records
- ? Possible sibling species.

From literature and some museum specimens.
Locations approximate.



Compiled by D.J.Heath, Dec. 1991.

Figure 1. Past and present distribution of *Quadrula fragosa*.

INTERSTATE PARK STUDY SITE

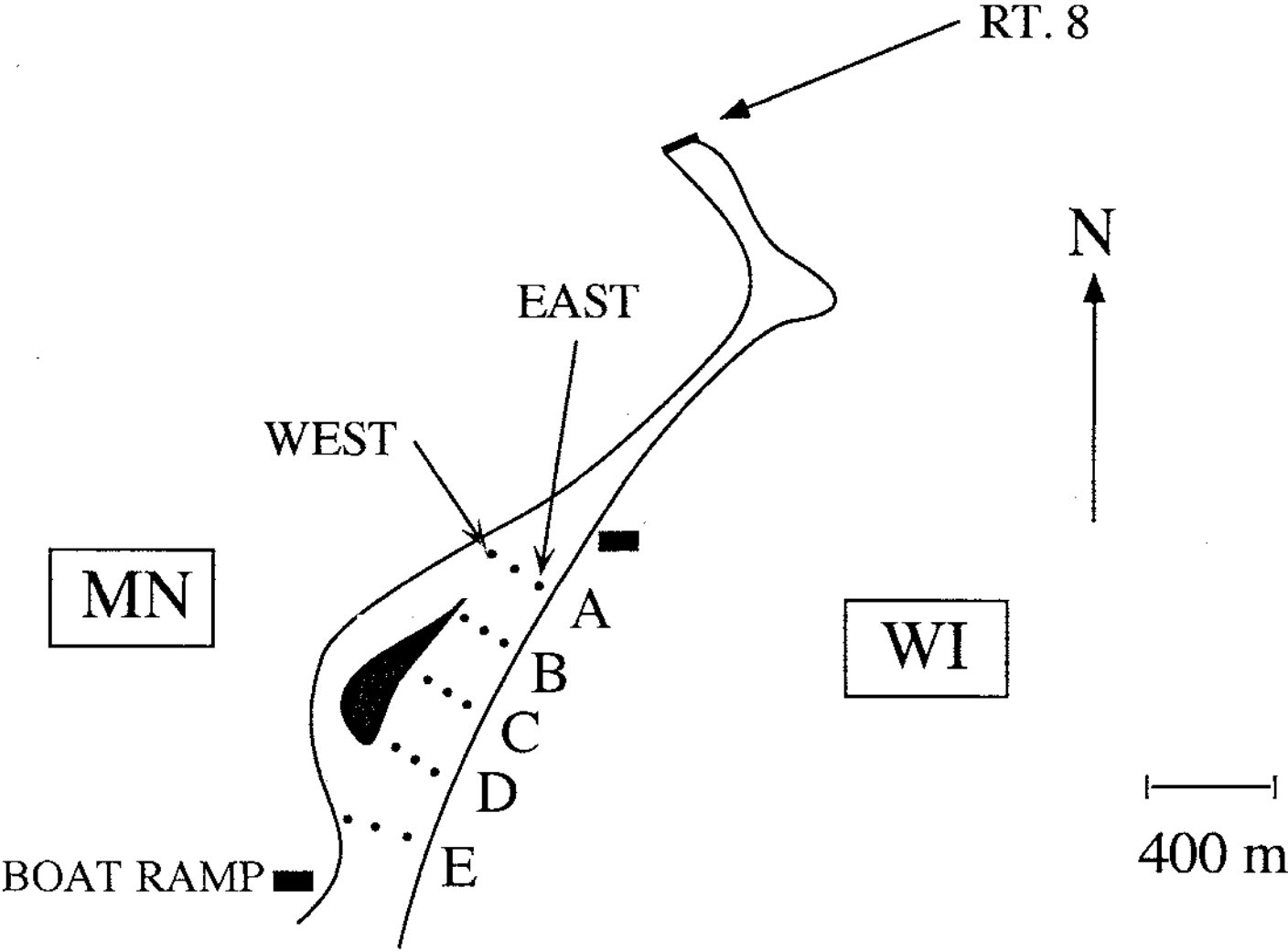


Figure 2. Map of study site. Small circles indicate the 15 locations where quantitative samples were taken.

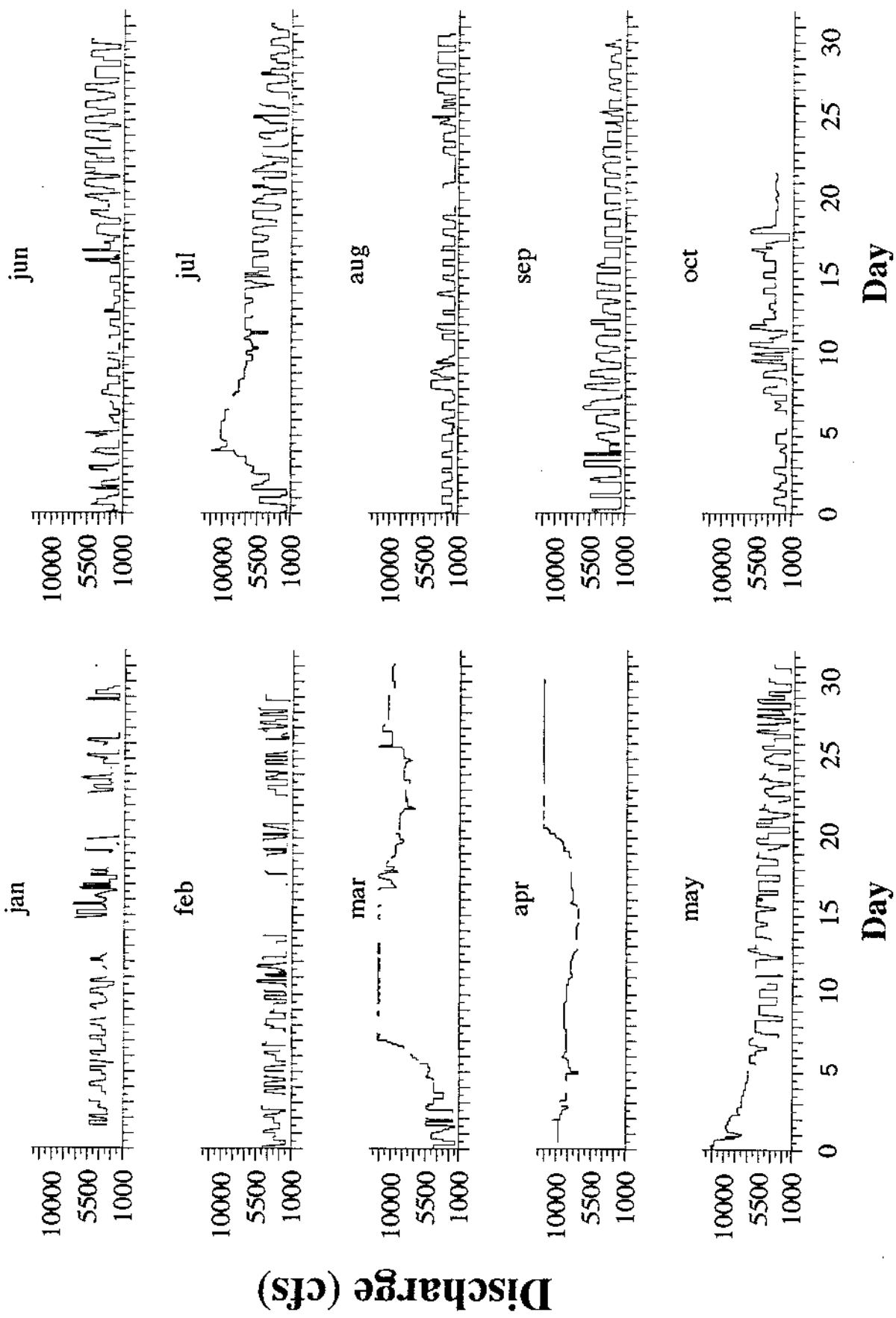


Figure 3. Mean hourly discharge levels from the USGS gage at St. Croix Falls, WI (Interstate Park) for 1992.

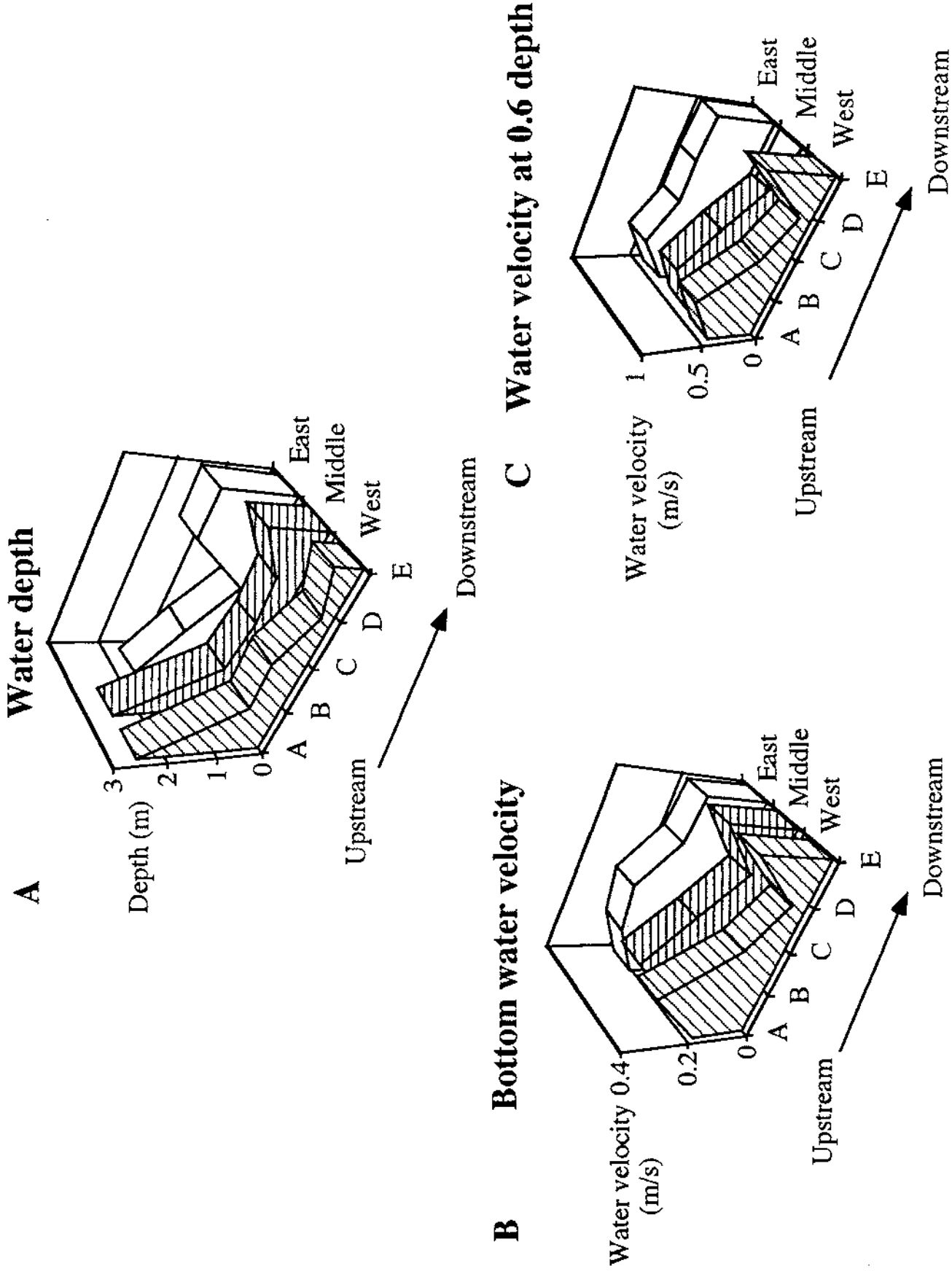
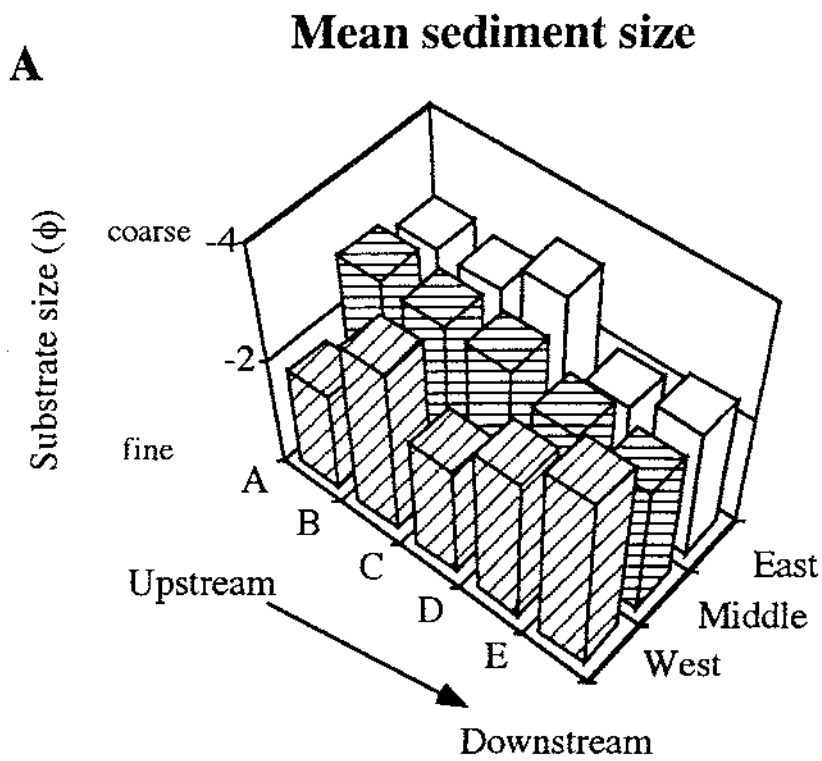


Figure 4. Habitat characteristics for the 15 sampling sites at Interstate Park. A. Water depth, B. Water velocity at the sediment water interface, C. Water velocity taken at the 0.6 depth.



B

Relationship between water depth and substrate size

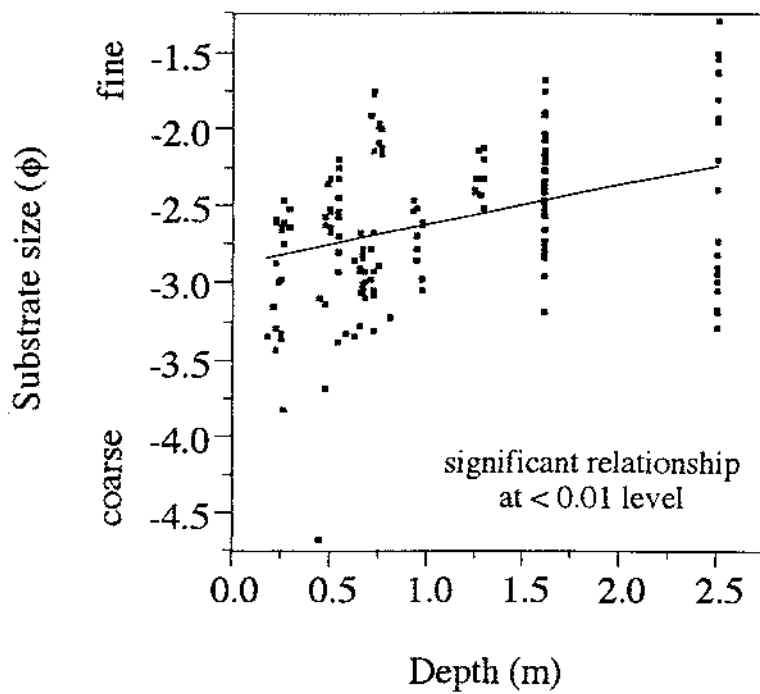
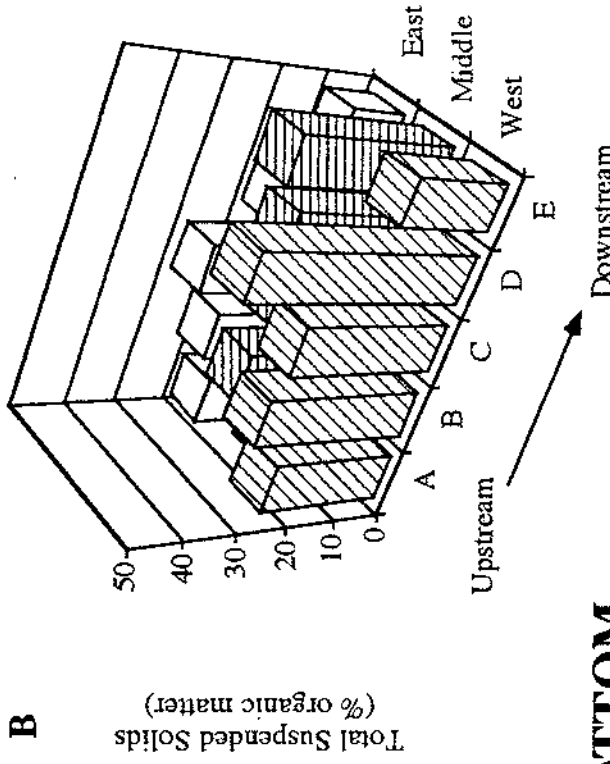
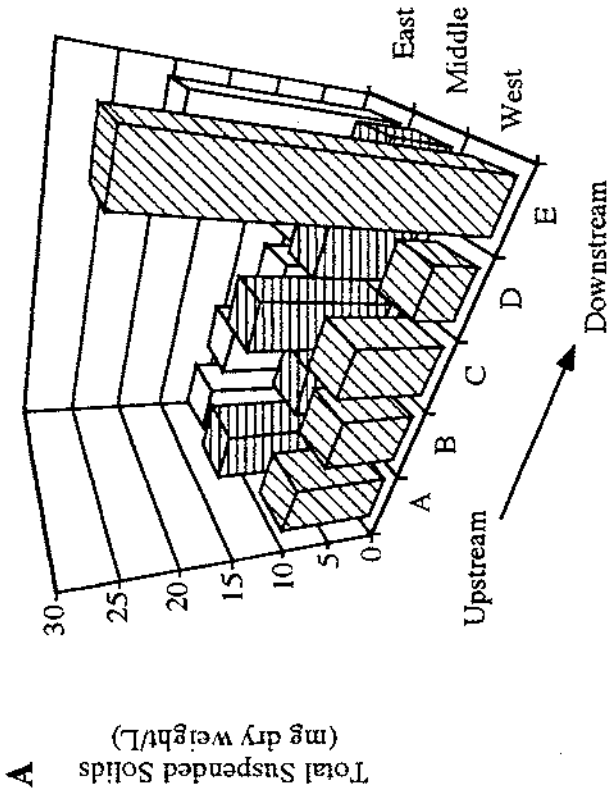


Figure 5. The mean sediment size at 15 sampling stations, Interstate Park (A) and the relationship between sediment size and water depth at these sites.

0.5 m ABOVE BOTTOM



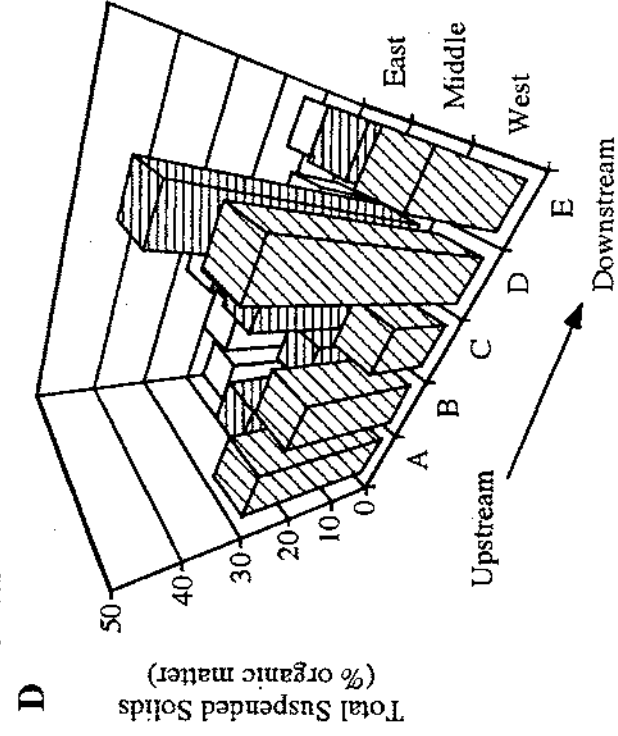
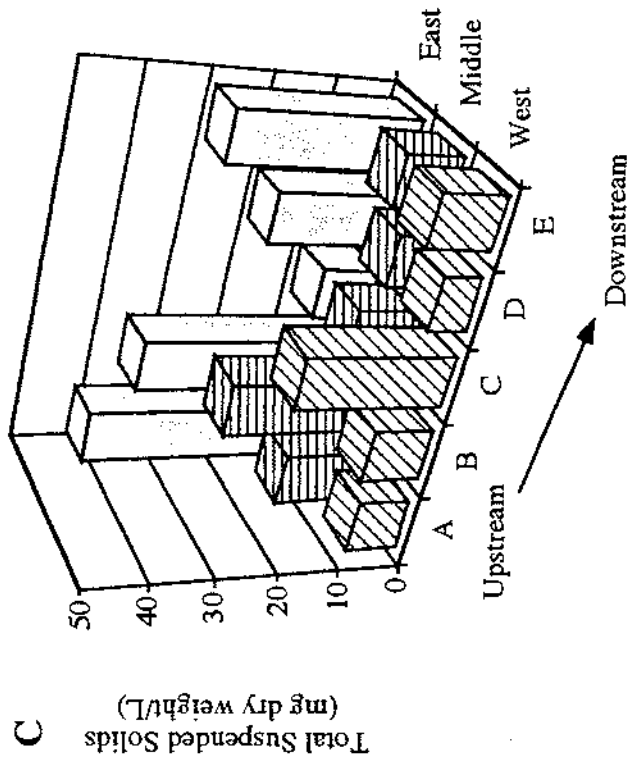
Upstream

Downstream

Upstream

Downstream

BOTTOM



Upstream

Downstream

Upstream

Downstream

Figure 6. Measures of total suspended solids in the water column taken at 15 sampling stations, Interstate Park. A and B are from water samples taken 0.5 m above the sediment water interface; A gives the amount of total suspended solids as dry weight and B gives the % organic matter of the solids. C and D are from water samples taken at the sediment water interface; C gives the amount of total suspended solids as dry weight and D gives the % organic matter of the solids.

Mussel community composition at Interstate Park

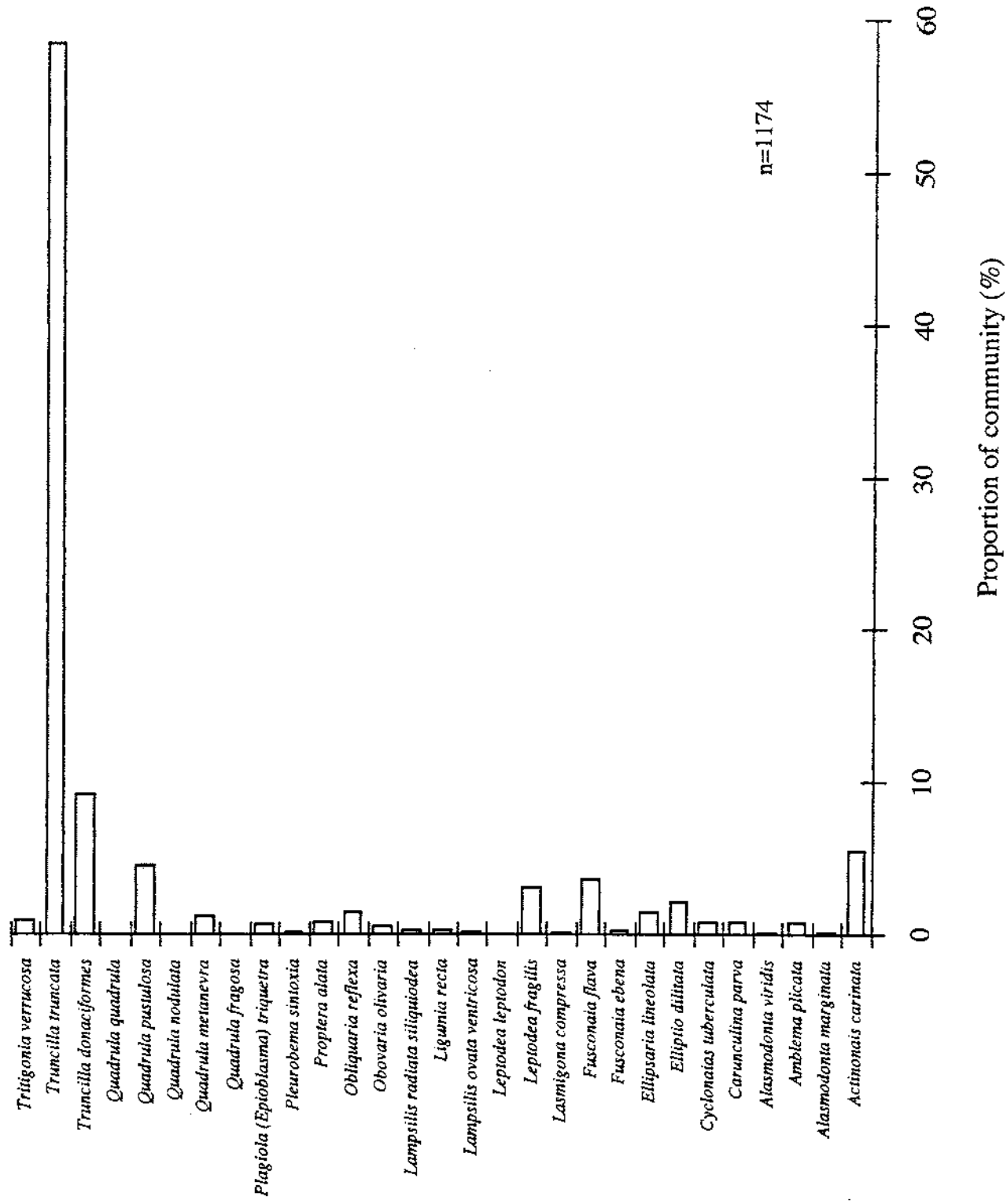
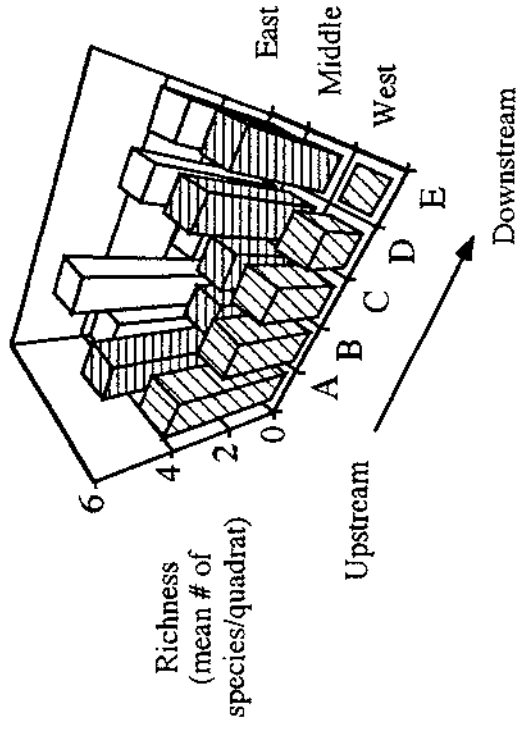


Figure 7. Mussel community structure at Interstate Park based on 150 0.25 m² quadrats.

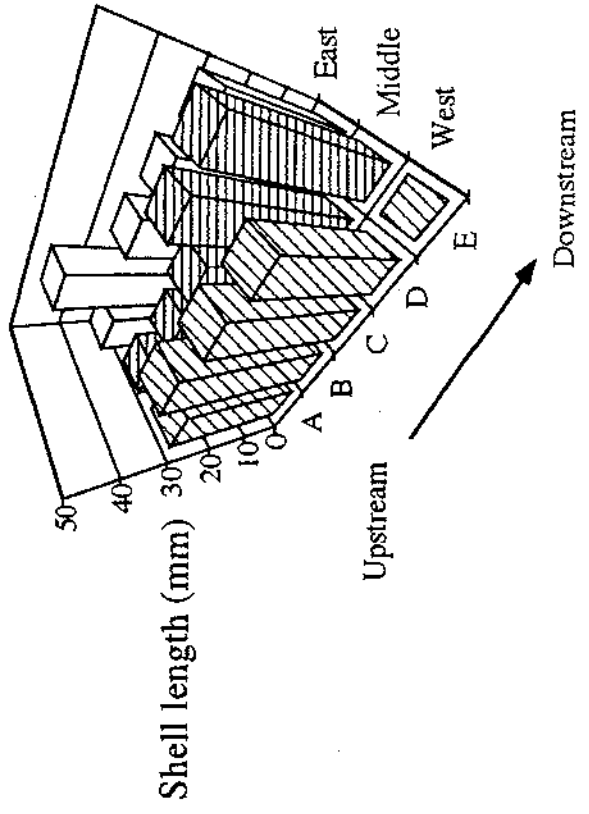
Mussel species richness

A



Mean mussel size

C



Mean mussel density

B

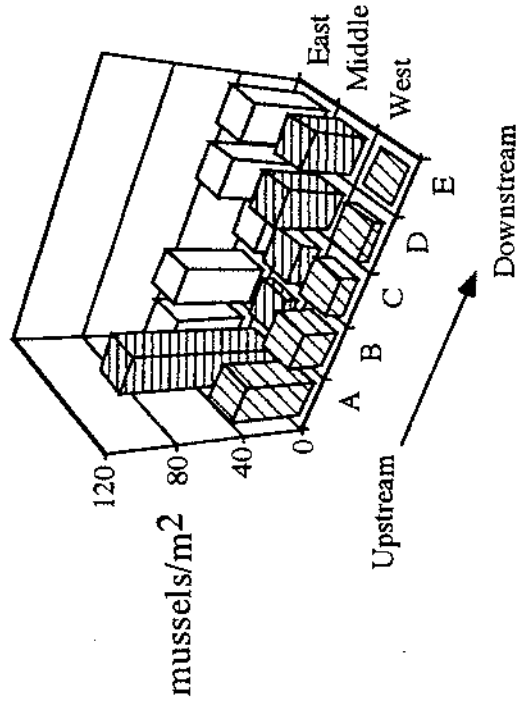
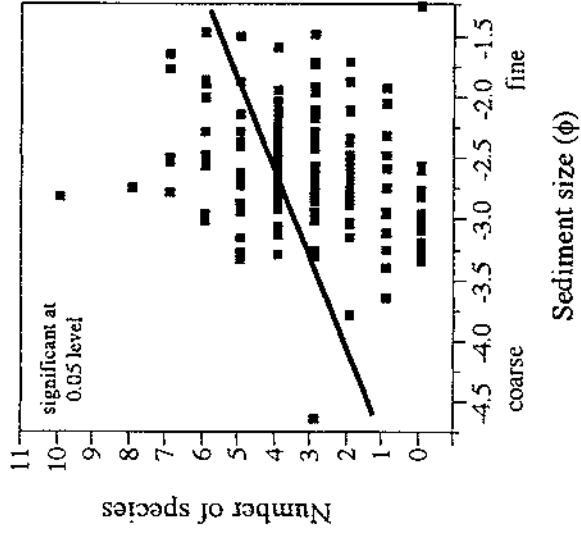
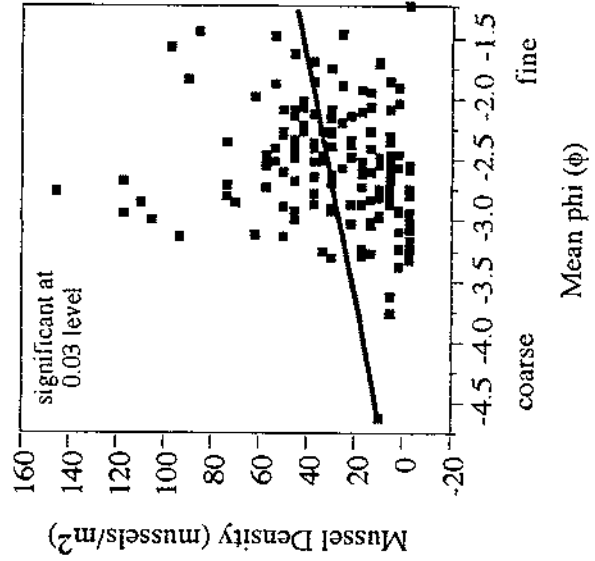


Figure 8. Mussels community structure at 15 sites, Interstate Park. A. Community richness, B. Mussel density, C. Size of mussels.

A Relationship between sediment size and mussel community richness



B Relationship between sediment size and mussel density



C Relationship between sediment size and size of mussels

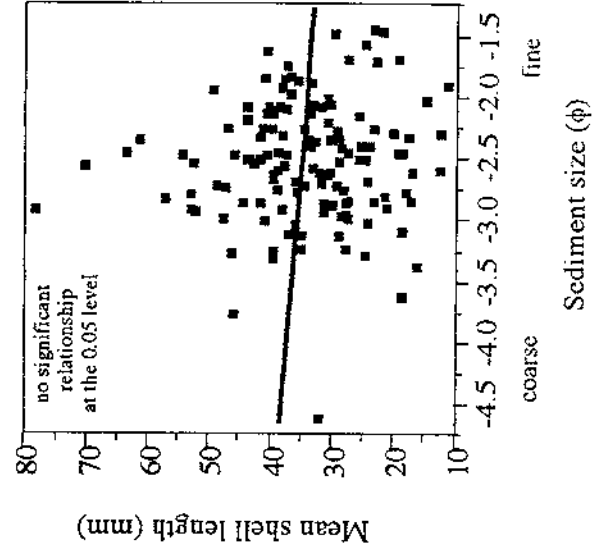
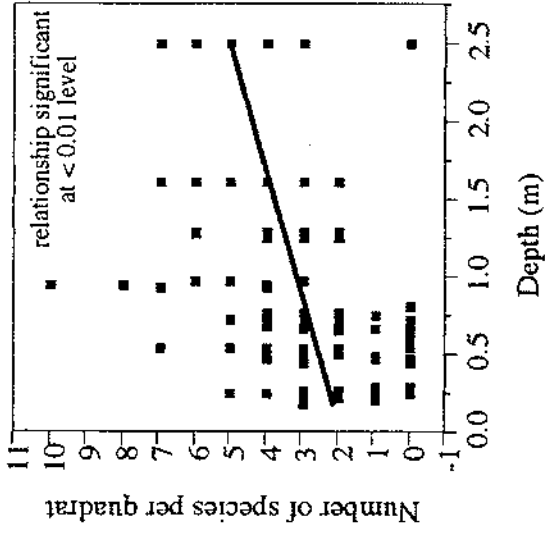
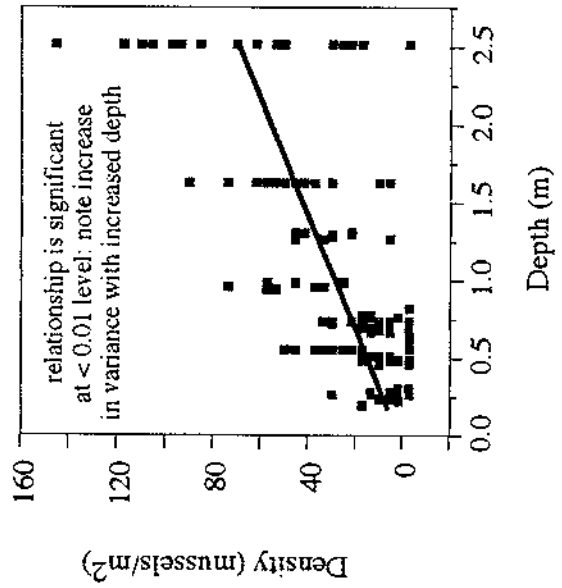


Figure 9. Relationship between sediment size and various mussel community parameters. A. Community richness, B. Mussel density, C. Size of mussels collected.

A Relationship between water depth and mussel community richness



B Relationship between water depth and mussel density



Mussel community composition at Interstate Park, 1992

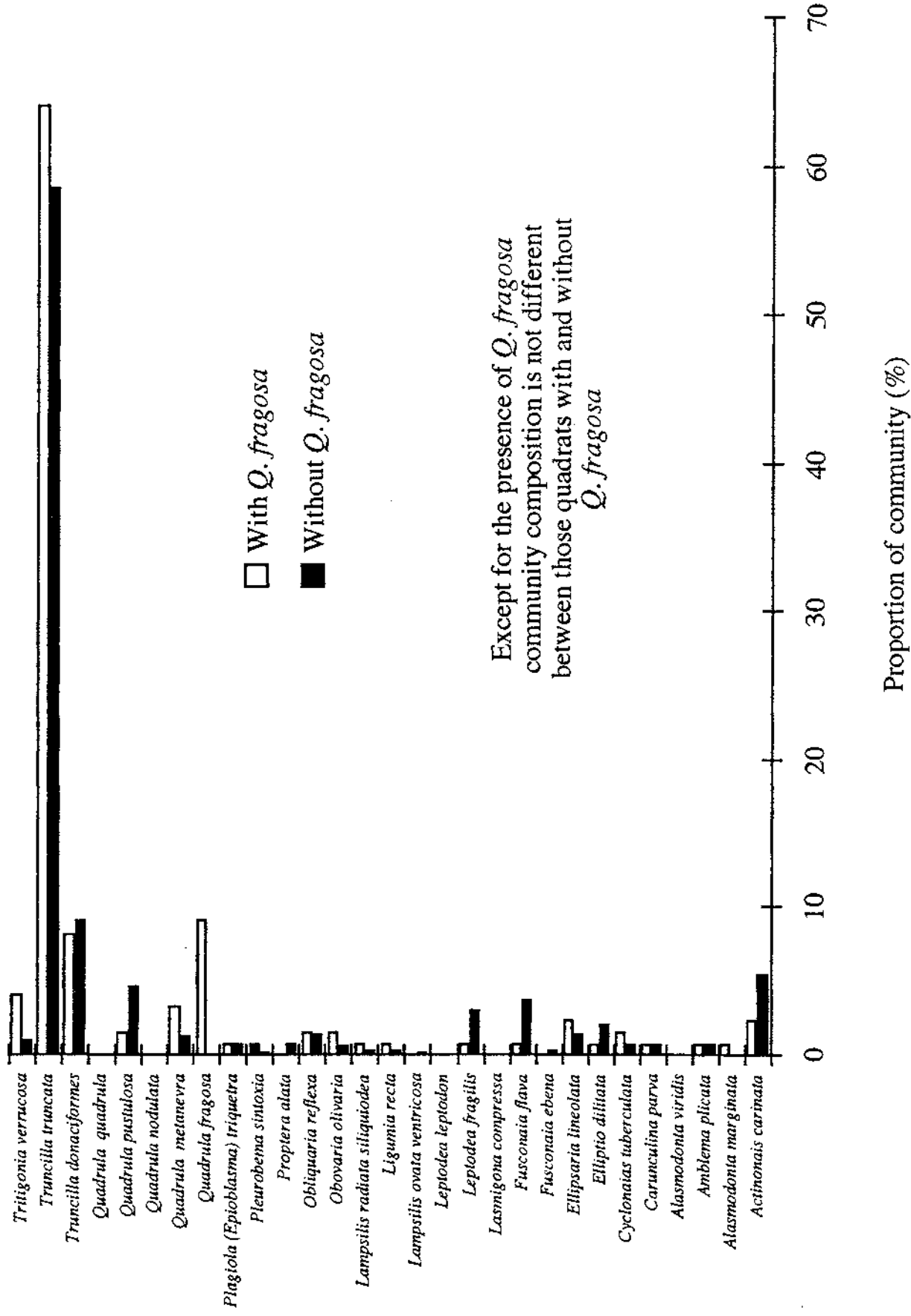
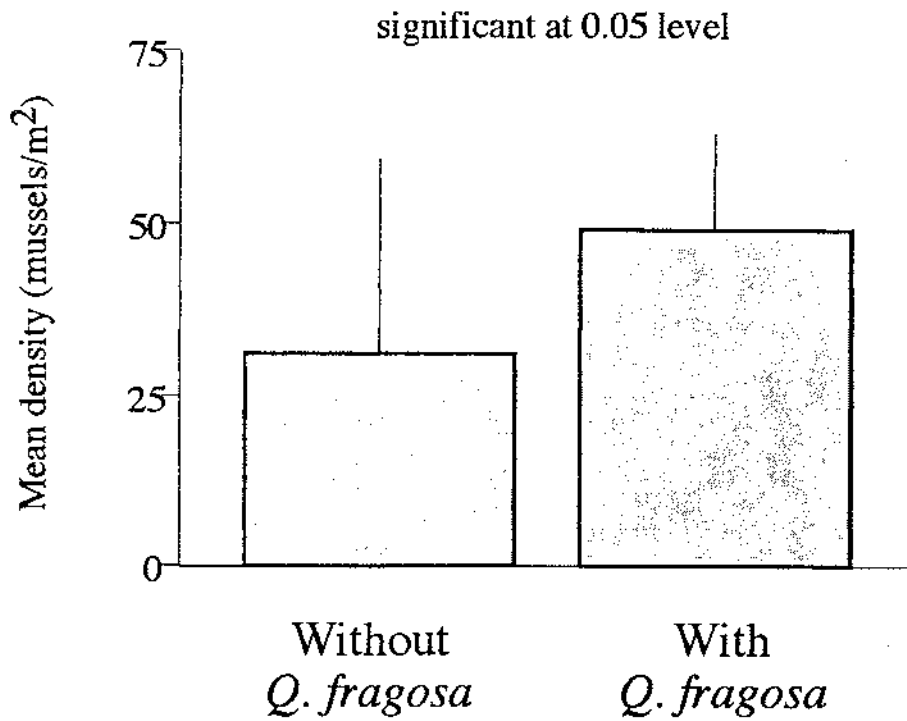


Figure 11. Comparison of the mussel community found with and without *Quadrula fragosa*

A Differences in mussel density in quadrats with and without *Quadrula fragosa*



B Differences in assemblage richness in quadrats with and without *Quadrula fragosa*

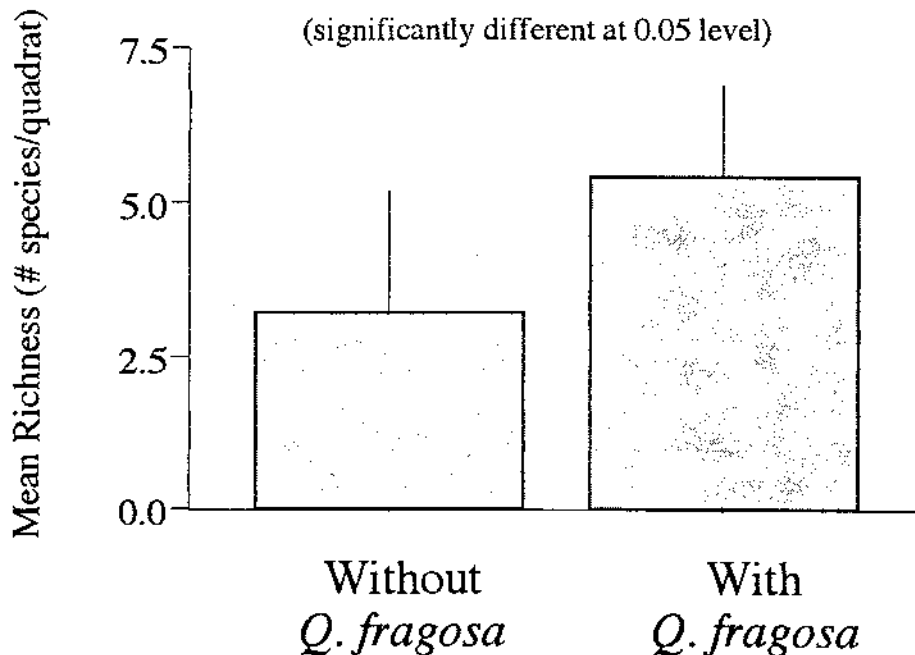
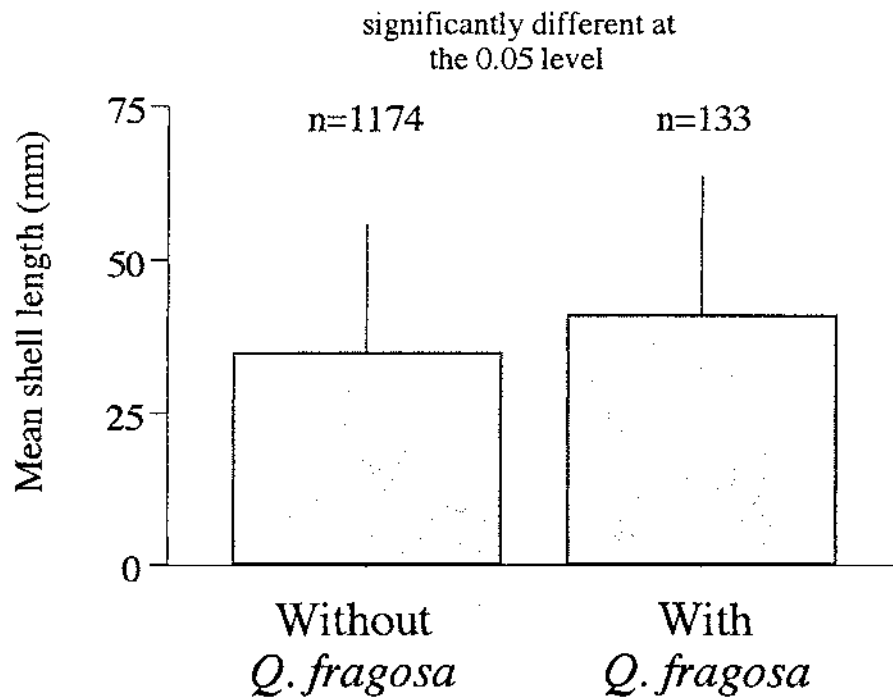


Figure 12. Comparison of mussel density (A) and community richness (B) in quadrats with and without *Quadrula fragosa*.

A Differences in mussel size in quadrats with and without *Quadrula fragosa*



B Differences in mean size of *Truncilla truncata* in quadrats with and without *Quadrula fragosa*

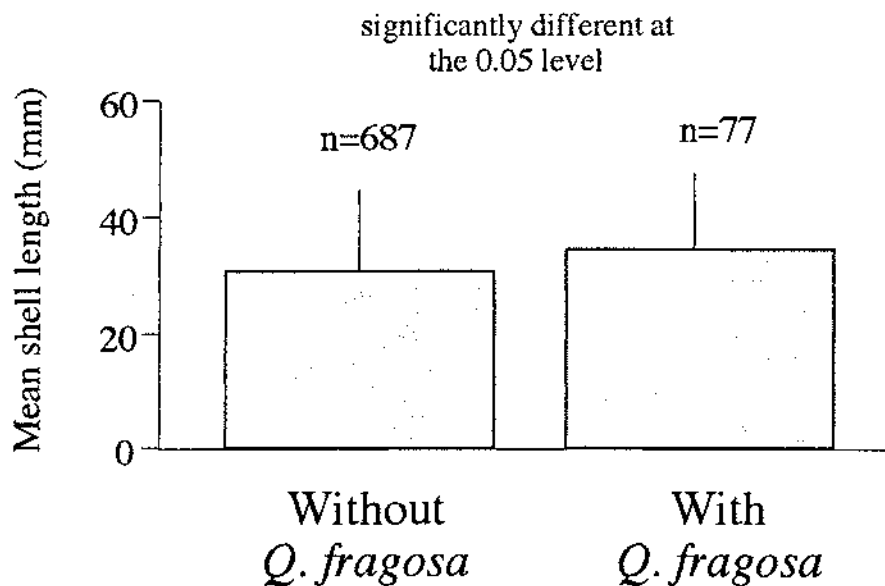
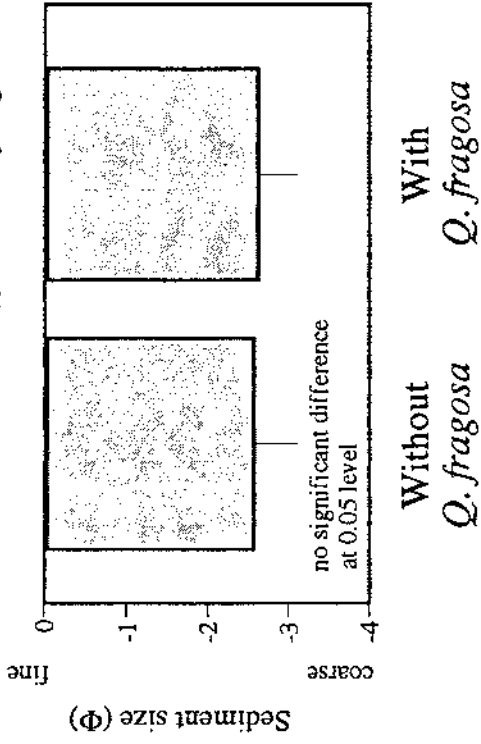
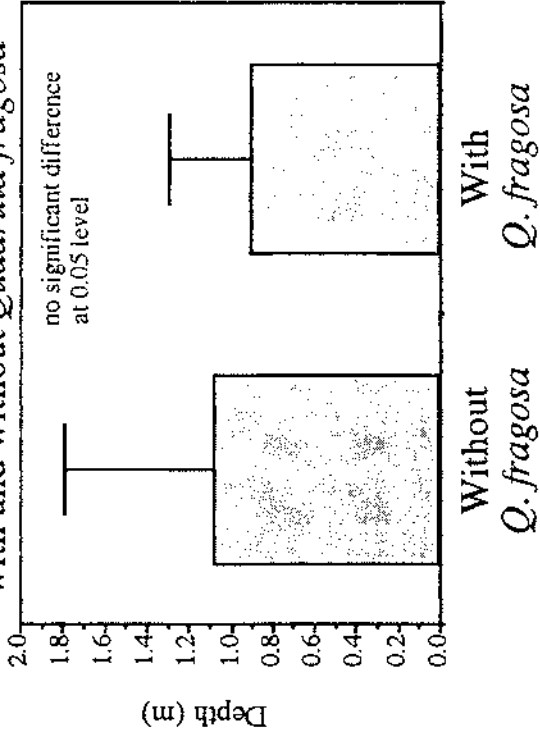


Figure 13. Difference in mussel size of all species collected (A) and for *Truncilla truncata* alone (B) in quadrats with and without *Quadrula fragosa*.

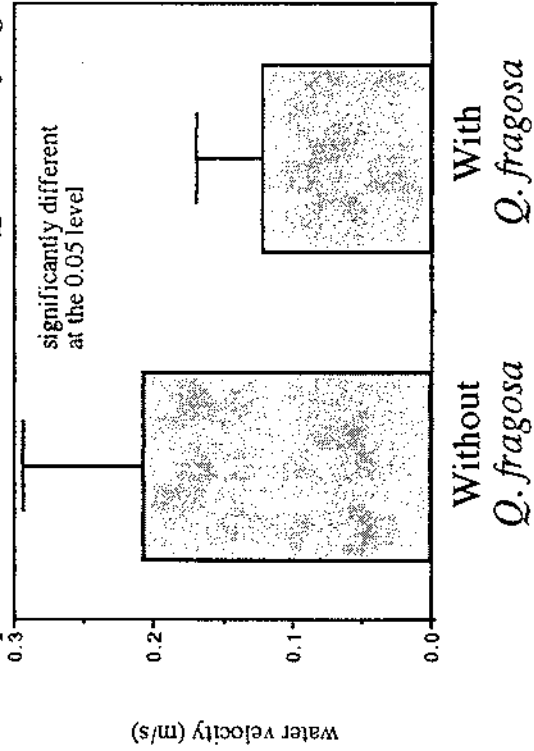
A Differences in substrate size in quadrats with and without *Quadrula fragosa*



B Differences in water depth in quadrats with and without *Quadrula fragosa*



C Differences in bottom water velocity in quadrats with and without *Quadrula fragosa*



D Differences in water velocity at 0.6 depth in quadrats with and without *Quadrula fragosa*

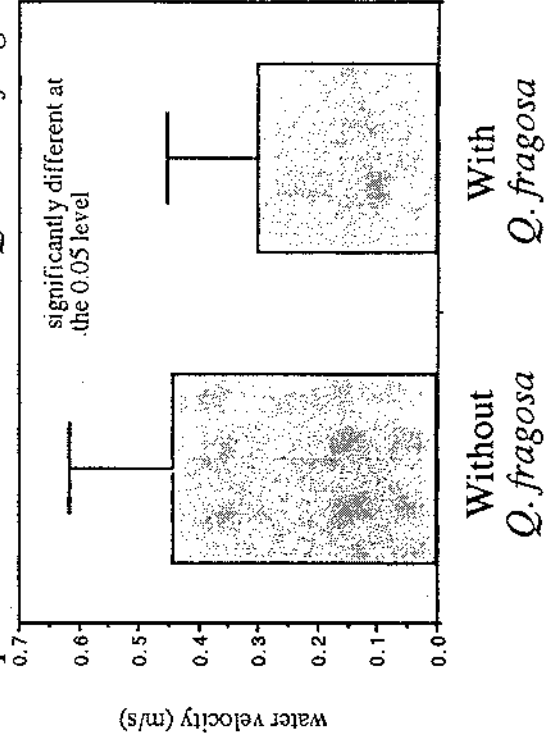


Figure 14. Differences in various habitat characteristics between quadrats with and without *Quadrula fragosa*.
 A. Sediment size, B. Water depth, C. Water velocity at the sediment-water interface,
 D. Water velocity at the 0.6 depth.

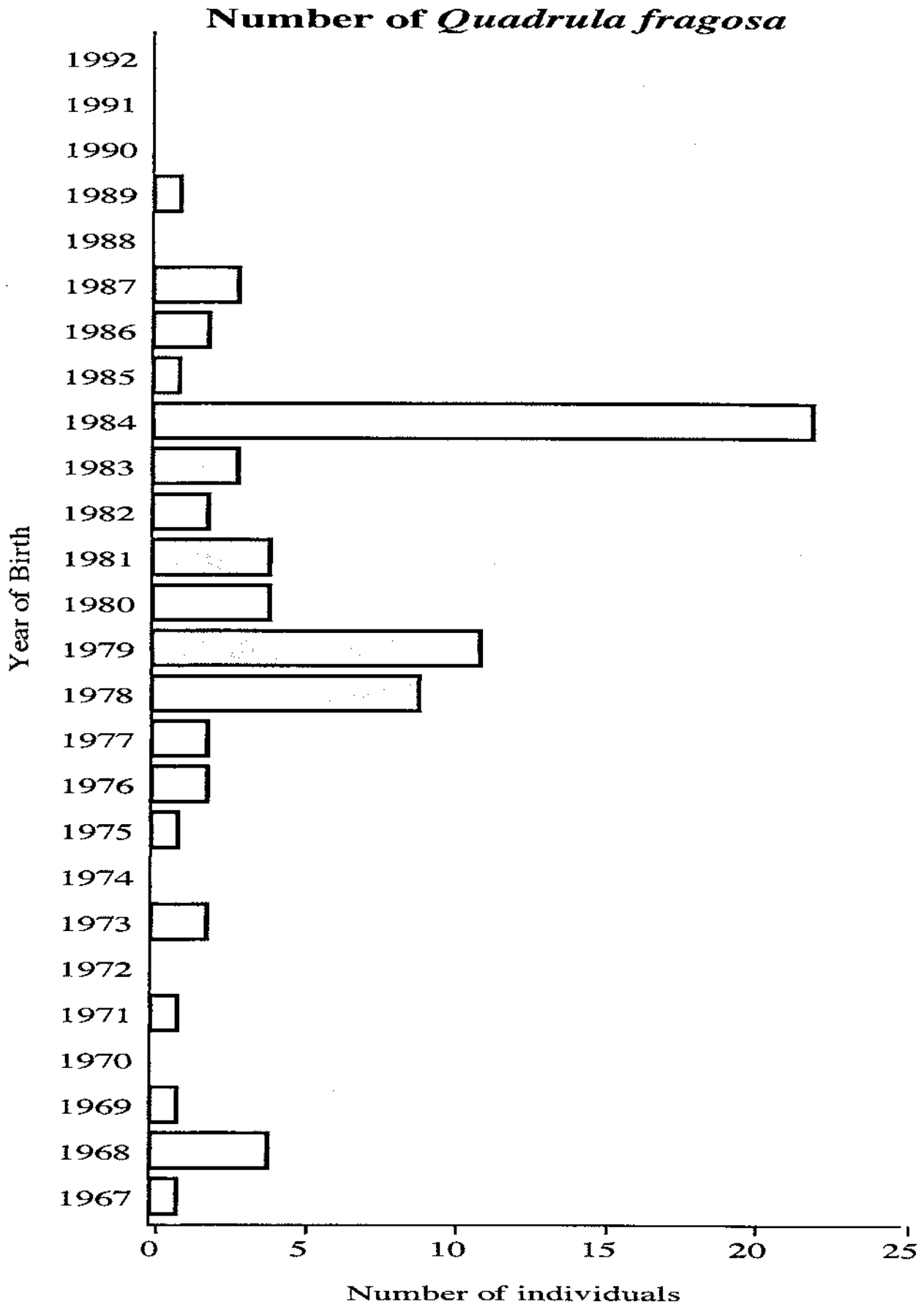


Figure 15. Number of *Quadrula fragosa* collected versus their year of birth, based on back-calculation from external growth rings.

**Relationship between shell length
and shell height in *Q. fragosa***

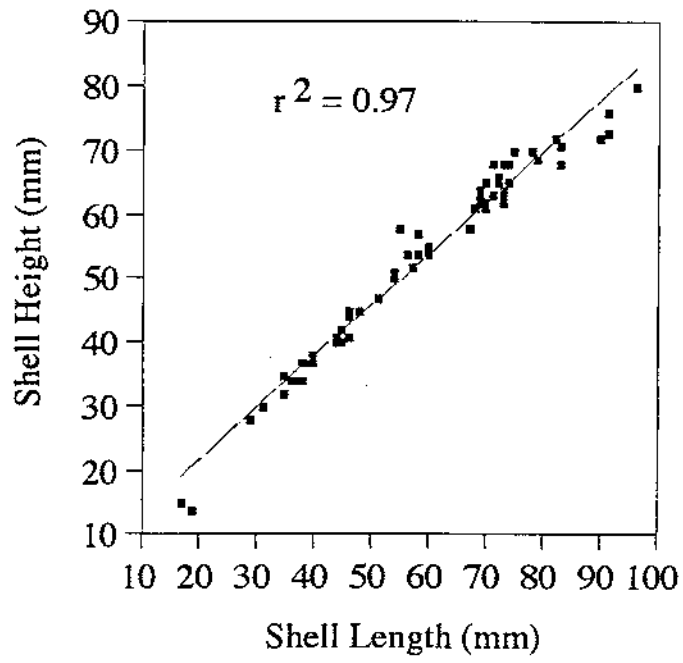


Figure 17. Relationship between shell length and shell height in *Quadrula fragosa*.

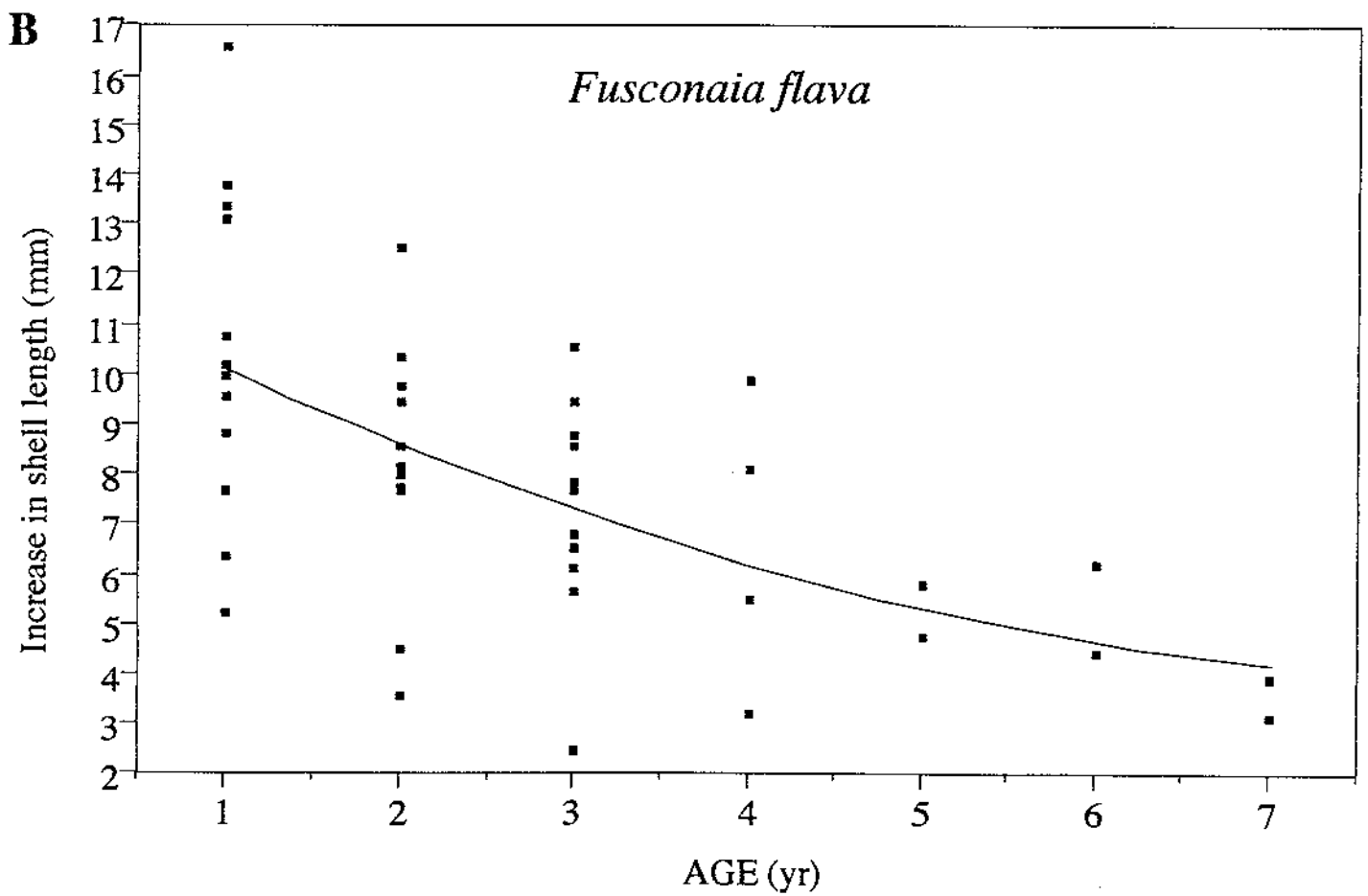
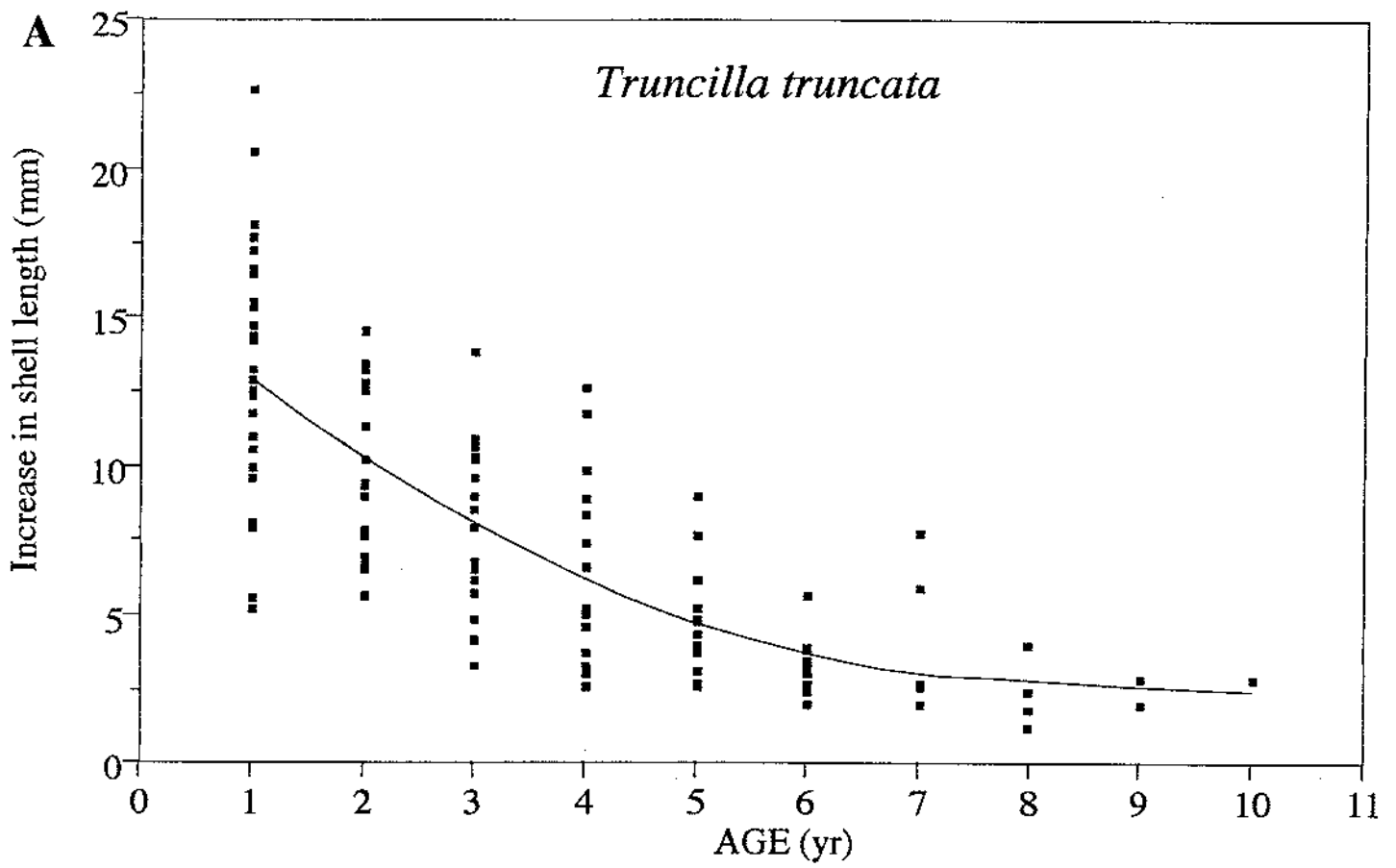
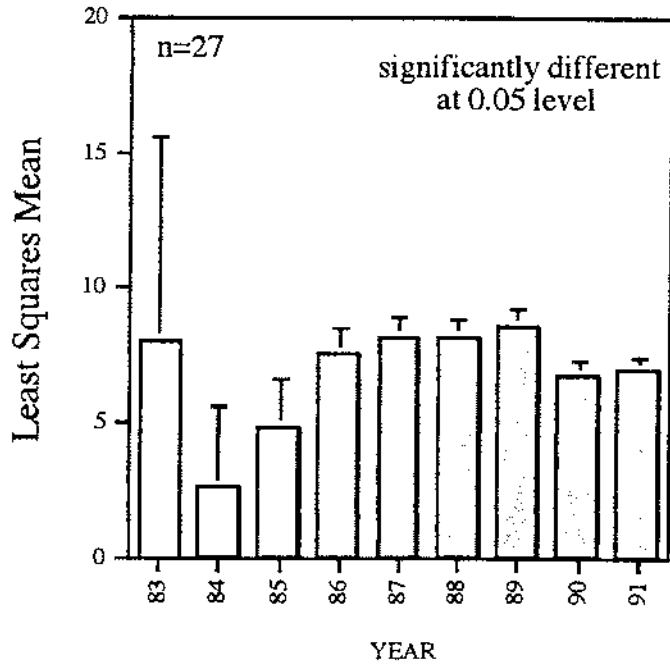


Figure 18. Relationship between age and increases in shell length for *Truncilla truncata* (A) and *Fusconaia flava* (B).

A Average Increase in shell length (mm)
for *Truncilla truncata*



B Average Increase in shell length (mm)
for *Fusconaia flava*

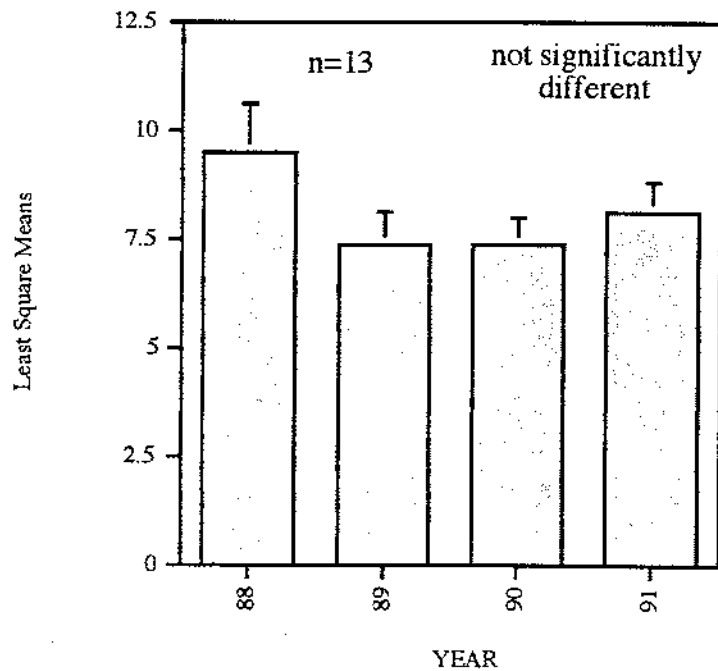


Figure 19. Variation in the increases in shell length (least squares means - mm) for *Truncilla truncata* (A) and *Fusconaia flava* (B).

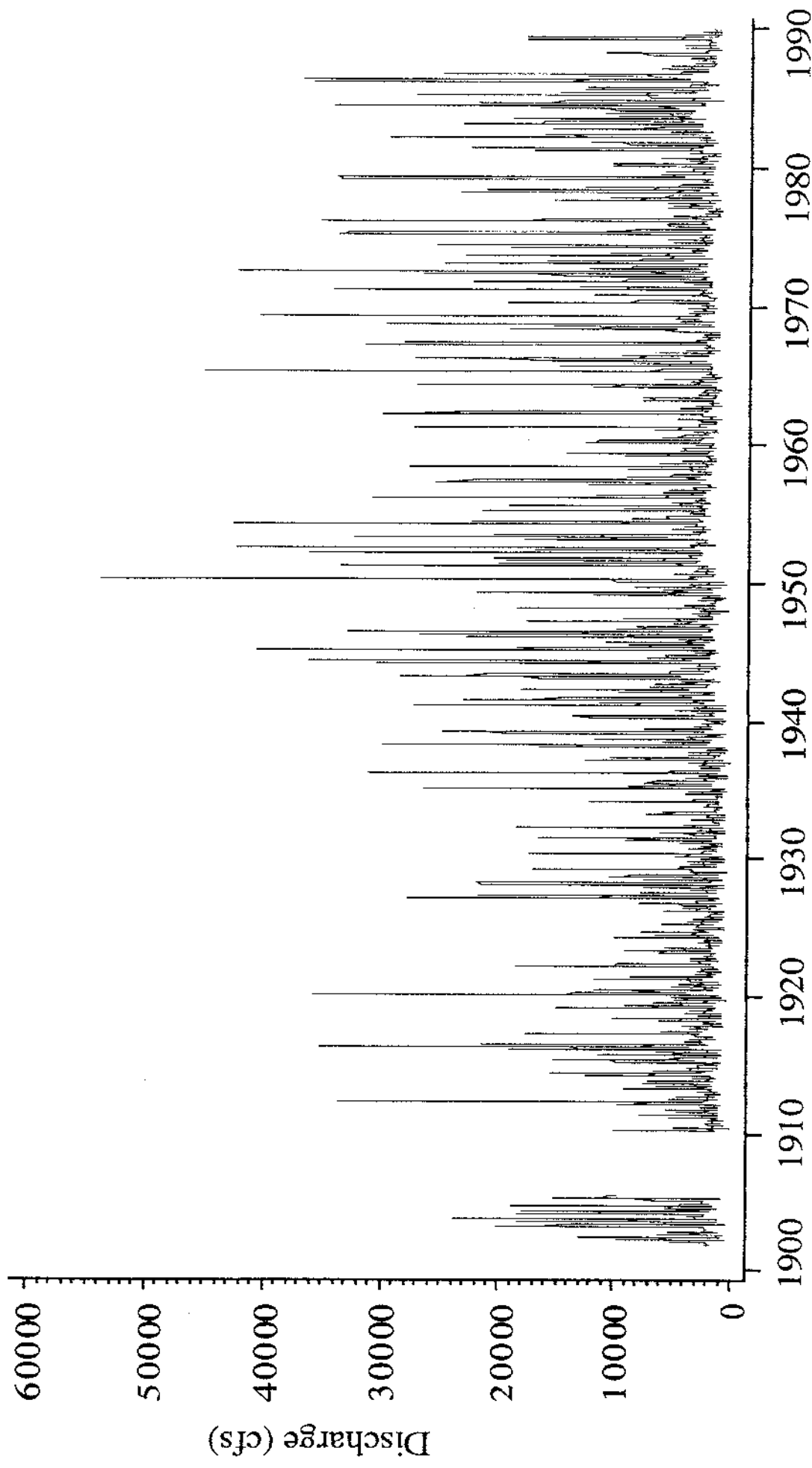


Figure 20. Mean daily discharge at Interstate Park 1902-1991.

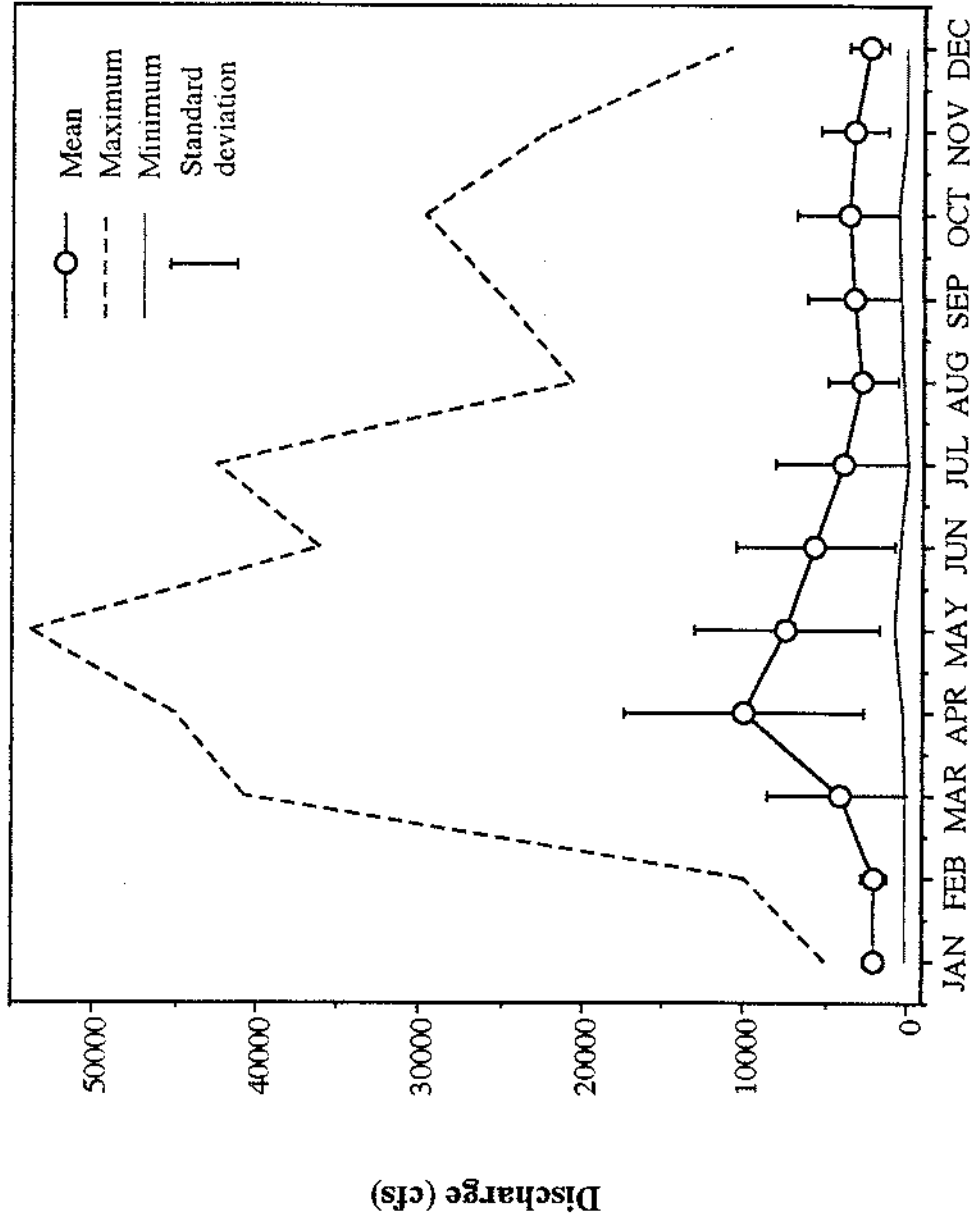


Figure 21. Average monthly discharge for the period 1902-1991. Maximum, minimum and the standard deviation of mean monthly flow are also given for the period.

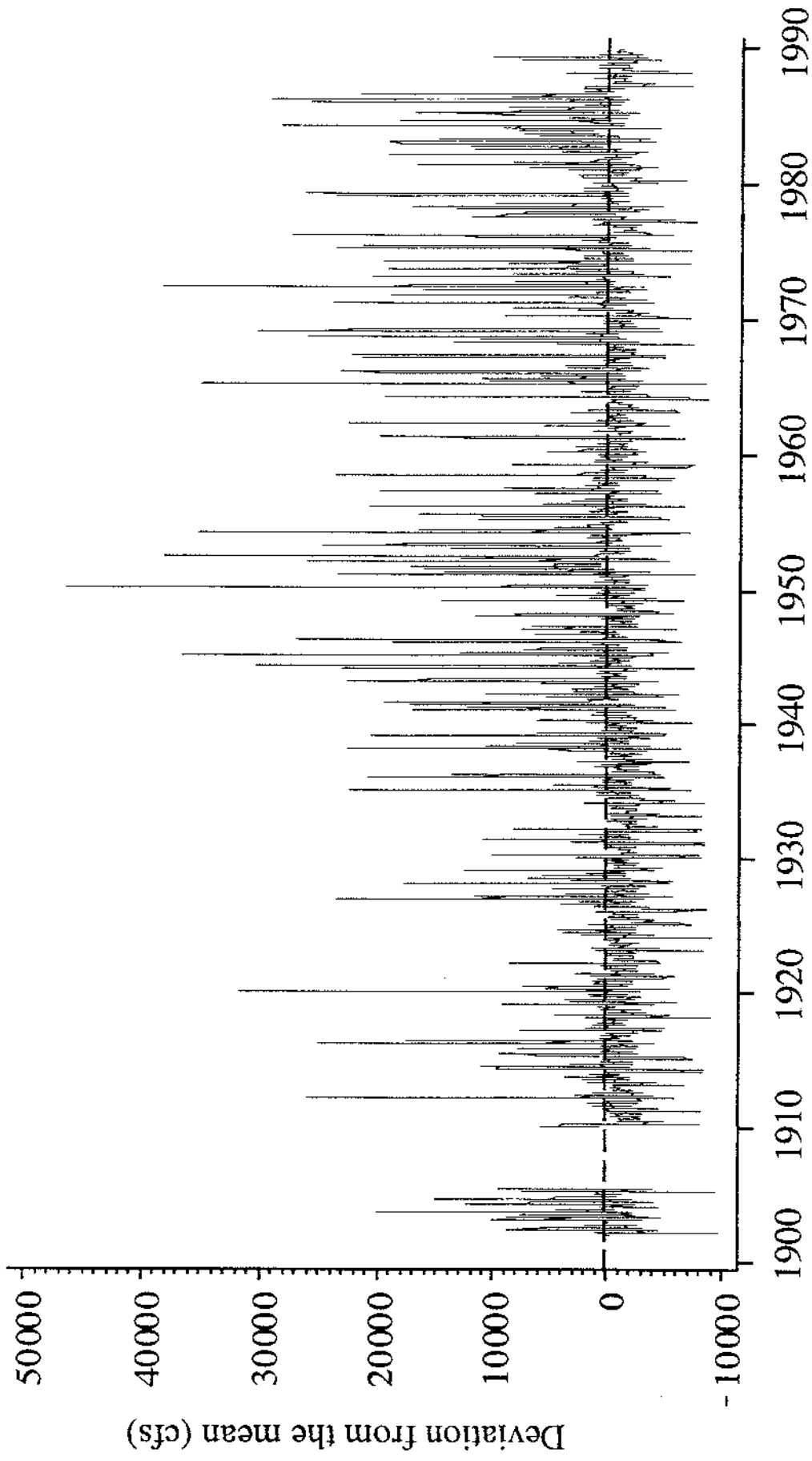
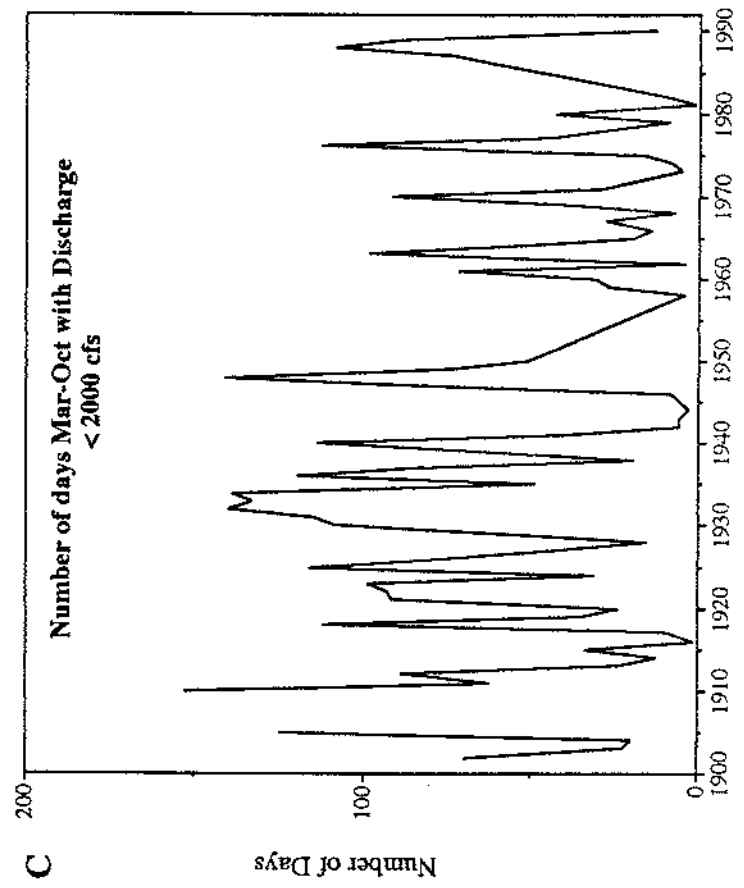
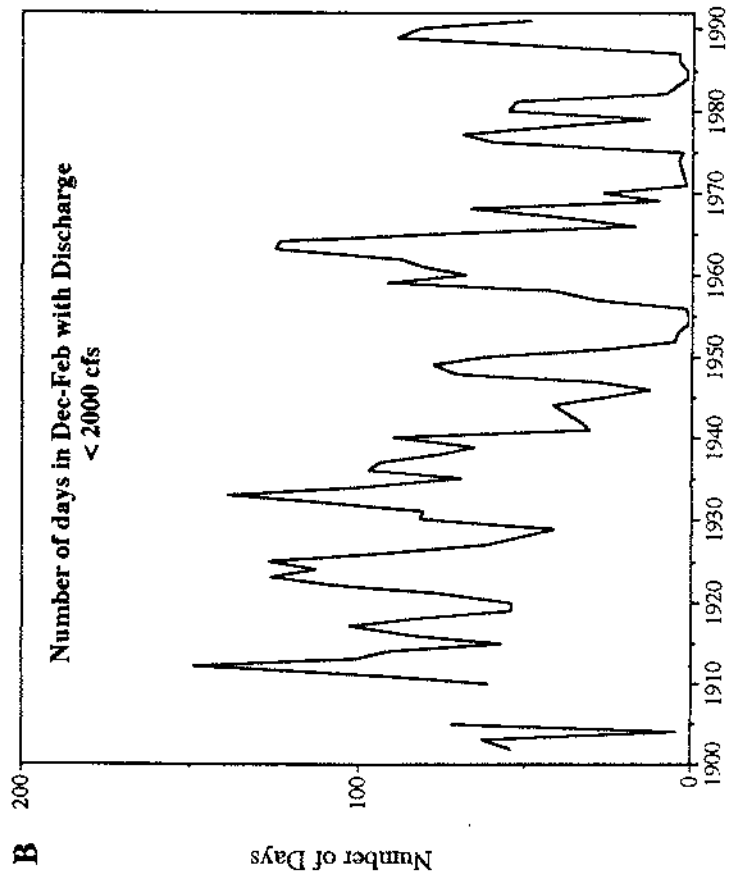
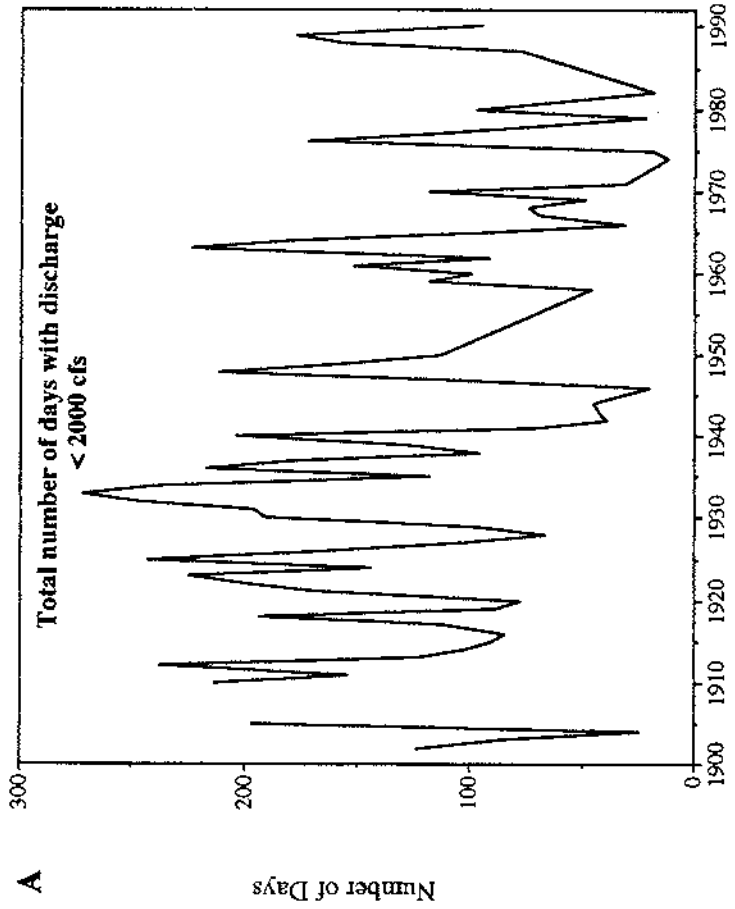


Figure 22. Deviation of the discharge from the mean discharge. The mean discharge for each month was taken from Fig. 20 and this mean was subtracted from the mean daily discharge to arrive at the deviation from the mean.

Figure 23. Number of days discharge was below 2000 cfs. A. Total days for each year. B. Potentially ice-covered portions of the year. C. Generally ice-free portions of the year.



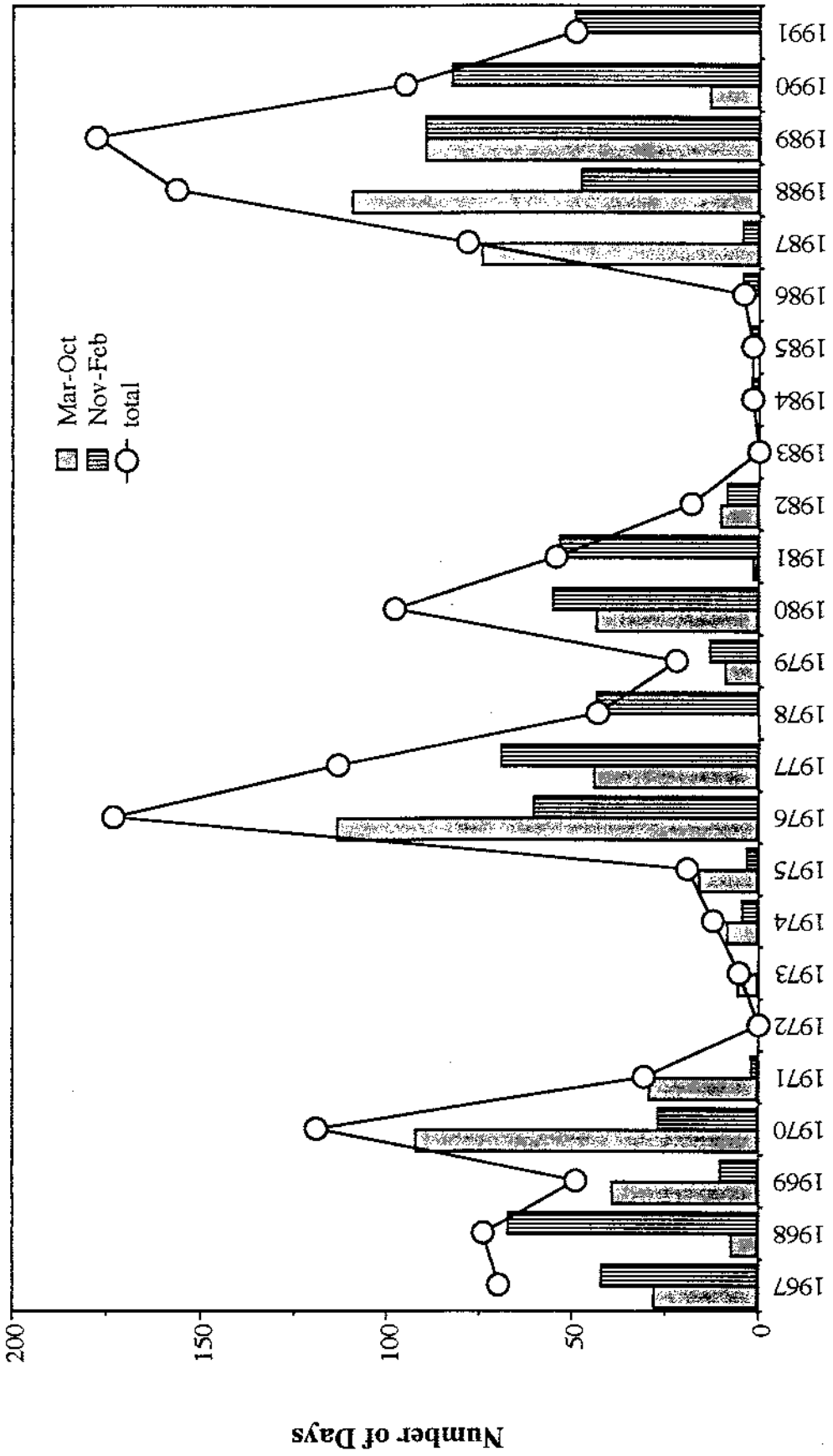


Figure 24. Number of days when mean discharge was < 2000 cfs for potentially ice-free and ice covered periods for 1967-1991. The total number of days with mean discharge < 2000 cfs is also given.

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
DM	6/4/92	<i>Actionais carinata</i>	70.83	29.57	44.66
DM	6/4/92	<i>Actionais carinata</i>	22.70	11.40	15.40
DM	6/4/92	<i>Actionais carinata</i>	57.85	24.50	36.40
CM	6/17/92	<i>Actionais carinata</i>	19.00	3.85	7.65
CM	6/17/92	<i>Actionais carinata</i>	20.00	5.75	10.75
CM	6/17/92	<i>Actionais carinata</i>	19.85	5.30	9.85
CM	6/17/92	<i>Actionais carinata</i>	18.25	5.20	10.05
CM	6/17/92	<i>Actionais carinata</i>	41.55	13.45	24.25
CM	6/17/92	<i>Actionais carinata</i>	32.95	10.60	18.70
CM	6/17/92	<i>Actionais carinata</i>	23.20	6.45	12.65
CW	6/17/92	<i>Actionais carinata</i>	49.55	11.05	30.00
CW	6/17/92	<i>Actionais carinata</i>	8.90	3.25	5.05
CW	6/17/92	<i>Actionais carinata</i>	46.10	17.50	28.95
CW	6/17/92	<i>Actionais carinata</i>	44.70	16.00	25.25
BM	6/18/92	<i>Actionais carinata</i>	39.90	13.20	31.20
BM	6/18/92	<i>Actionais carinata</i>	15.30	4.00	8.30
BM	6/18/92	<i>Actionais carinata</i>	10.90	4.30	8.90
BW	6/18/92	<i>Actionais carinata</i>	20.30	5.50	111.25
BW	6/18/92	<i>Actionais carinata</i>	16.80	4.60	9.00
BW	6/18/92	<i>Actionais carinata</i>	19.75	5.45	10.85
BW	6/18/92	<i>Actionais carinata</i>	19.85	5.90	10.50
BW	6/18/92	<i>Actionais carinata</i>	14.35	3.85	7.90
BW	6/18/92	<i>Actionais carinata</i>	14.05	3.75	8.00
BW	6/18/92	<i>Actionais carinata</i>	81.85	31.55	50.70
BW	6/18/92	<i>Actionais carinata</i>	71.25	27.70	45.80
EM	6/23/92	<i>Actionais carinata</i>	10.25	3.75	6.10
AE	6/24/92	<i>Actionais carinata</i>	21.50	6.35	12.15
AE	6/24/92	<i>Actionais carinata</i>	19.85	5.20	10.35
AE	6/24/92	<i>Actionais carinata</i>	22.50	6.30	13.50
AE	6/24/92	<i>Actionais carinata</i>	10.25	3.60	5.75
AE	6/24/92	<i>Actionais carinata</i>	20.55	6.10	10.45
AE	6/24/92	<i>Actionais carinata</i>	20.80	5.90	11.30
AE	6/24/92	<i>Actionais carinata</i>	31.95	10.10	17.60
AM	6/24/92	<i>Actionais carinata</i>	37.65	11.10	30.40
AM	6/24/92	<i>Actionais carinata</i>	88.90	44.75	74.55
AM	6/24/92	<i>Actionais carinata</i>	42.85	5.80	11.70
AM	6/24/92	<i>Actionais carinata</i>	10.90	4.05	6.35
AM	6/24/92	<i>Actionais carinata</i>	57.50	21.90	42.45
AM	6/24/92	<i>Actionais carinata</i>	19.45	5.50	10.90
AM	6/24/92	<i>Actionais carinata</i>	18.00	7.90	11.20
AM	6/24/92	<i>Actionais carinata</i>	20.25	4.00	10.70
DE	6/25/92	<i>Actionais carinata</i>	70.50	29.70	45.85
DE	6/25/92	<i>Actionais carinata</i>	8.35	2.85	4.75
DE	6/25/92	<i>Actionais carinata</i>	68.10	41.20	53.15
DE	6/25/92	<i>Actionais carinata</i>	122.45	62.20	88.95
DE	6/25/92	<i>Actionais carinata</i>	38.45	11.85	25.90
EE	6/25/92	<i>Actionais carinata</i>	39.90	13.20	23.90
EE	6/25/92	<i>Actionais carinata</i>	9.55	2.95	5.65
CE	6/30/92	<i>Actionais carinata</i>	20.75	5.45	11.25
CE	6/30/92	<i>Actionais carinata</i>	20.00	6.10	11.25
CE	6/30/92	<i>Actionais carinata</i>	17.45	4.35	9.05
CE	6/30/92	<i>Actionais carinata</i>	79.10	30.25	51.50

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
CE	6/30/92	<i>Actionais carinata</i>	41.90	13.40	24.45
BE	6/30/92	<i>Actionais carinata</i>	88.25	33.55	53.75
BE	6/30/92	<i>Actionais carinata</i>	10.40	4.15	6.50
BE	6/30/92	<i>Actionais carinata</i>	105.15	43.85	68.35
BE	6/30/92	<i>Actionais carinata</i>	49.50	16.50	29.20
BE	6/30/92	<i>Actionais carinata</i>	84.10	24.60	46.20
BE	6/30/92	<i>Actionais carinata</i>	56.75	18.80	34.90
BE	6/30/92	<i>Actionais carinata</i>	20.00	4.90	10.40
BE	6/30/92	<i>Actionais carinata</i>	79.20	35.00	52.85
BE	6/30/92	<i>Actionais carinata</i>	101.10	38.10	62.60
BE	6/30/92	<i>Actionais carinata</i>	17.30	4.80	9.50
BE	6/30/92	<i>Actionais carinata</i>	84.50	35.05	52.10
BE	6/30/92	<i>Actionais carinata</i>	14.20	3.90	7.50
BE	6/30/92	<i>Alasmodonta marginata</i>	67.40	36.55	34.60
BE	6/30/92	<i>Alasmodonta marginata</i>	45.30	17.50	22.90
DM	6/4/92	<i>Amblema plicata</i>	30.04	16.57	24.12
DM	6/4/92	<i>Amblema plicata</i>	26.80	15.40	23.45
DM	6/4/92	<i>Amblema plicata</i>	63.80	32.30	53.50
EM	6/23/92	<i>Amblema plicata</i>	11.20	5.50	9.20
DE	6/25/92	<i>Amblema plicata</i>	22.55	14.65	20.40
DE	6/25/92	<i>Amblema plicata</i>	7.80	3.00	4.35
DE	6/25/92	<i>Amblema plicata</i>	21.50	12.85	18.85
DE	6/25/92	<i>Amblema plicata</i>	99.45	51.00	72.80
DE	6/25/92	<i>Amblema plicata</i>	29.40	16.80	26.60
EE	6/25/92	<i>Amblema plicata</i>	21.15	12.30	16.60
EM	6/23/92	<i>Alasmodonta viridis</i>	17.50	8.10	11.90
AM	6/24/92	<i>Alasmodonta viridis</i>	9.75	3.35	5.75
BM	6/18/92	<i>Carunculina parva</i>	21.40	4.85	15.95
BM	6/18/92	<i>Carunculina parva</i>	46.75	13.05	21.35
BW	6/18/92	<i>Carunculina parva</i>	34.45	12.60	17.50
BW	6/18/92	<i>Carunculina parva</i>	34.50	12.10	17.00
BW	6/18/92	<i>Carunculina parva</i>	29.70	11.35	15.65
EM	6/23/92	<i>Carunculina parva</i>	28.35	9.00	16.25
AE	6/24/92	<i>Carunculina parva</i>	15.10	5.75	8.95
AM	6/24/92	<i>Carunculina parva</i>	10.35	3.90	6.05
AM	6/24/92	<i>Carunculina parva</i>	7.90	2.75	4.70
AM	6/24/92	<i>Carunculina parva</i>	17.15	3.90	8.15
DM	6/4/92	<i>Cyclonaias tuberculata</i>	70.44	44.79	63.52
EM	6/23/92	<i>Cyclonaias tuberculata</i>	82.75	47.00	79.60
AE	6/24/92	<i>Cyclonaias tuberculata</i>	74.25	39.90	70.30
AE	6/24/92	<i>Cyclonaias tuberculata</i>	84.40	48.15	80.25
AE	6/24/92	<i>Cyclonaias tuberculata</i>	80.15	43.90	81.55
AM	6/24/92	<i>Cyclonaias tuberculata</i>	9.95	5.80	8.60
DE	6/25/92	<i>Cyclonaias tuberculata</i>	16.90	10.05	15.35
AW	7/1/92	<i>Cyclonaias tuberculata</i>	12.60	7.05	10.75
BE	6/30/92	<i>Cyclonaias tuberculata</i>	74.80	46.80	65.90
BE	6/30/92	<i>Cyclonaias tuberculata</i>	86.80	43.90	79.55
EM	6/23/92	<i>Elliptio dilatata</i>	11.40	4.40	6.90
CM	6/17/92	<i>Elliptio dilatata</i>	41.90	11.35	20.25
CM	6/17/92	<i>Elliptio dilatata</i>	42.05	10.90	19.25
CM	6/17/92	<i>Elliptio dilatata</i>	43.60	12.05	20.10
CM	6/17/92	<i>Elliptio dilatata</i>	42.80	11.55	19.80
CM	6/17/92	<i>Elliptio dilatata</i>	46.90	12.05	21.40

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
CW	6/17/92	<i>Elliptio dilutata</i>	47.30	17.15	21.60
CW	6/17/92	<i>Elliptio dilutata</i>	51.30	12.45	23.00
CW	6/17/92	<i>Elliptio dilutata</i>	52.50	14.70	27.05
BM	6/18/92	<i>Elliptio dilutata</i>	36.05	9.75	12.45
BW	6/18/92	<i>Elliptio dilutata</i>	88.50	29.60	46.85
BW	6/18/92	<i>Elliptio dilutata</i>	70.30	23.45	36.00
EM	6/23/92	<i>Elliptio dilutata</i>	119.05	40.00	59.20
AE	6/24/92	<i>Elliptio dilutata</i>	92.40	31.65	48.70
DE	6/25/92	<i>Elliptio dilutata</i>	71.20	22.75	36.10
DE	6/25/92	<i>Elliptio dilutata</i>	77.25	24.05	39.45
DE	6/25/92	<i>Elliptio dilutata</i>	58.30	15.50	31.90
EE	6/25/92	<i>Elliptio dilutata</i>	118.15	34.10	57.80
EE	6/25/92	<i>Elliptio dilutata</i>	52.80	11.55	26.65
EE	6/25/92	<i>Elliptio dilutata</i>	118.50	39.90	58.85
EE	6/25/92	<i>Elliptio dilutata</i>	94.00	29.10	56.20
CE	6/30/92	<i>Elliptio dilutata</i>	53.05	15.30	29.25
CE	6/30/92	<i>Elliptio dilutata</i>	57.90	15.25	28.15
CE	6/30/92	<i>Elliptio dilutata</i>	53.55	15.20	26.05
BE	6/30/92	<i>Elliptio dilutata</i>	81.20	22.80	36.40
BE	6/30/92	<i>Elliptio dilutata</i>	104.65	35.25	54.55
DM	6/4/92	<i>Ellipsaria lineolata</i>	55.21	24.10	43.23
DM	6/4/92	<i>Ellipsaria lineolata</i>	55.00	29.30	47.40
DM	6/4/92	<i>Ellipsaria lineolata</i>	86.55	35.30	74.90
DM	6/4/92	<i>Ellipsaria lineolata</i>	27.60	19.50	19.90
BW	6/18/92	<i>Ellipsaria lineolata</i>	40.75	11.00	27.90
BW	6/18/92	<i>Ellipsaria lineolata</i>	16.50	11.05	5.50
EM	6/23/92	<i>Ellipsaria lineolata</i>	43.50	18.40	33.20
AE	6/24/92	<i>Ellipsaria lineolata</i>	68.45	25.85	53.20
AE	6/24/92	<i>Ellipsaria lineolata</i>	7.70	3.45	5.25
AM	6/24/92	<i>Ellipsaria lineolata</i>	34.70	10.25	30.05
AM	6/24/92	<i>Ellipsaria lineolata</i>	53.80	24.50	47.40
AM	6/24/92	<i>Ellipsaria lineolata</i>	48.00	23.10	41.80
DE	6/25/92	<i>Ellipsaria lineolata</i>	33.15	11.00	25.35
EE	6/25/92	<i>Ellipsaria lineolata</i>	87.30	39.40	67.60
EE	6/25/92	<i>Ellipsaria lineolata</i>	53.45	22.65	42.55
EE	6/25/92	<i>Ellipsaria lineolata</i>	58.00	32.30	53.70
CE	6/30/92	<i>Ellipsaria lineolata</i>	65.50	22.50	38.50
BE	6/30/92	<i>Ellipsaria lineolata</i>	87.40	39.60	72.85
DM	6/4/92	<i>Fusconaia ebena</i>	95.50	53.04	74.15
DM	6/4/92	<i>Fusconaia ebena</i>	71.05	42.15	68.40
EE	6/25/92	<i>Fusconaia ebena</i>	76.80	44.50	71.70
BE	6/30/92	<i>Fusconaia ebena</i>	63.00	36.30	60.30
BE	6/30/92	<i>Fusconaia ebena</i>	68.60	42.40	61.90
DM	6/4/92	<i>Fusconaia flava</i>	55.90	36.60	46.75
DM	6/4/92	<i>Fusconaia flava</i>	81.00	42.00	68.10
DM	6/4/92	<i>Fusconaia flava</i>	59.00	35.60	43.50
DM	6/4/92	<i>Fusconaia flava</i>	54.40	32.90	46.10
DM	6/4/92	<i>Fusconaia flava</i>	61.00	31.50	51.50
DM	6/4/92	<i>Fusconaia flava</i>	55.35	35.10	46.35
DM	6/4/92	<i>Fusconaia flava</i>	52.25	35.90	45.00
DM	6/4/92	<i>Fusconaia flava</i>	44.85	40.20	30.60
DW	6/9/92	<i>Fusconaia flava</i>	20.00	13.25	17.05
DW	6/9/92	<i>Fusconaia flava</i>	16.55	10.35	13.90

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
DW	6/9/92	<i>Fusconaia flava</i>	16.50	9.20	13.45
CM	6/17/92	<i>Fusconaia flava</i>	21.50	13.25	17.80
CM	6/17/92	<i>Fusconaia flava</i>	24.00	15.75	21.20
CM	6/17/92	<i>Fusconaia flava</i>	24.30	16.20	21.25
CW	6/17/92	<i>Fusconaia flava</i>	27.05	17.15	22.85
CW	6/17/92	<i>Fusconaia flava</i>	45.60	31.50	39.85
CW	6/17/92	<i>Fusconaia flava</i>	23.35	15.65	20.45
CW	6/17/92	<i>Fusconaia flava</i>	25.00	11.70	21.70
CW	6/17/92	<i>Fusconaia flava</i>	22.70	15.50	19.55
CW	6/17/92	<i>Fusconaia flava</i>	24.25	15.75	22.00
CW	6/17/92	<i>Fusconaia flava</i>	24.40	15.70	21.40
BM	6/18/92	<i>Fusconaia flava</i>	45.00	30.40	41.35
BW	6/18/92	<i>Fusconaia flava</i>	12.00	6.00	10.40
EM	6/23/92	<i>Fusconaia flava</i>	40.45	27.50	37.30
EM	6/23/92	<i>Fusconaia flava</i>	72.25	43.15	58.35
AE	6/24/92	<i>Fusconaia flava</i>	18.00	10.15	15.80
AM	6/24/92	<i>Fusconaia flava</i>	20.05	11.30	12.20
DE	6/25/92	<i>Fusconaia flava</i>	18.80	11.15	16.35
DE	6/25/92	<i>Fusconaia flava</i>	20.60	11.60	16.95
EE	6/25/92	<i>Fusconaia flava</i>	30.00	20.45	28.90
EE	6/25/92	<i>Fusconaia flava</i>	18.80	13.00	17.65
EE	6/25/92	<i>Fusconaia flava</i>	17.30	10.20	15.15
EE	6/25/92	<i>Fusconaia flava</i>	16.85	9.40	14.40
EE	6/25/92	<i>Fusconaia flava</i>	18.60	11.10	16.45
EE	6/25/92	<i>Fusconaia flava</i>	17.05	10.90	14.70
EE	6/25/92	<i>Fusconaia flava</i>	14.45	18.50	13.05
EE	6/25/92	<i>Fusconaia flava</i>	20.15	11.65	16.50
AW	7/1/92	<i>Fusconaia flava</i>	26.70	13.35	24.20
AW	7/1/92	<i>Fusconaia flava</i>	9.70	4.50	6.95
CE	6/30/92	<i>Fusconaia flava</i>	26.70	15.70	23.10
CE	6/30/92	<i>Fusconaia flava</i>	24.85	15.95	21.60
CE	6/30/92	<i>Fusconaia flava</i>	26.00	15.50	22.40
CE	6/30/92	<i>Fusconaia flava</i>	28.80	16.95	25.20
CE	6/30/92	<i>Fusconaia flava</i>	26.00	15.50	22.40
DW	6/9/92	<i>Lasmigona compressa</i>	46.65	10.75	34.30
EE	6/25/92	<i>Lasmigona compressa</i>	75.15	16.20	58.40
DM	6/4/92	<i>Leptodea fragilis</i>	11.10	3.08	6.56
DM	6/4/92	<i>Leptodea fragilis</i>	20.68	6.10	11.70
DM	6/4/92	<i>Leptodea fragilis</i>	13.95	3.45	7.84
DM	6/4/92	<i>Leptodea fragilis</i>	20.85	6.50	11.10
DM	6/4/92	<i>Leptodea fragilis</i>	14.40	4.00	8.30
DW	6/9/92	<i>Leptodea fragilis</i>	14.20	3.30	7.95
DW	6/9/92	<i>Leptodea fragilis</i>	16.00	3.75	10.10
CM	6/17/92	<i>Leptodea fragilis</i>	51.15	13.35	29.90
CM	6/17/92	<i>Leptodea fragilis</i>	18.25	4.10	10.55
CM	6/17/92	<i>Leptodea fragilis</i>	49.80	15.90	31.25
CW	6/17/92	<i>Leptodea fragilis</i>	25.00	6.00	13.80
CW	6/17/92	<i>Leptodea fragilis</i>	16.90	5.20	9.20
BW	6/18/92	<i>Leptodea fragilis</i>	24.00	6.25	13.60
EM	6/23/92	<i>Leptodea fragilis</i>	16.05	3.75	9.15
AE	6/24/92	<i>Leptodea fragilis</i>	19.00	5.60	11.30
AE	6/24/92	<i>Leptodea fragilis</i>	50.40	16.70	30.30
AE	6/24/92	<i>Leptodea fragilis</i>	23.90	6.40	12.70

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
AE	6/24/92	<i>Leptodea fragilis</i>	22.95	5.95	12.45
AM	6/24/92	<i>Leptodea fragilis</i>	24.35	6.30	12.40
DE	6/25/92	<i>Leptodea fragilis</i>	122.00	37.00	79.50
DE	6/25/92	<i>Leptodea fragilis</i>	18.65	5.25	10.40
DE	6/25/92	<i>Leptodea fragilis</i>	98.35	29.90	59.45
DE	6/25/92	<i>Leptodea fragilis</i>	23.00	6.45	12.20
DE	6/25/92	<i>Leptodea fragilis</i>	105.30	35.40	71.50
DE	6/25/92	<i>Leptodea fragilis</i>	50.90	15.80	32.25
DE	6/25/92	<i>Leptodea fragilis</i>	124.45	36.70	82.10
EE	6/25/92	<i>Leptodea fragilis</i>	10.70	4.25	6.35
EE	6/25/92	<i>Leptodea fragilis</i>	8.35	2.90	4.95
AW	7/1/92	<i>Leptodea fragilis</i>	21.00	6.25	13.20
AW	7/1/92	<i>Leptodea fragilis</i>	19.50	5.55	11.40
AW	7/1/92	<i>Leptodea fragilis</i>	26.80	7.25	16.40
CE	6/30/92	<i>Leptodea fragilis</i>	19.40	4.80	10.00
BE	6/30/92	<i>Leptodea fragilis</i>	18.80	5.40	10.45
BE	6/30/92	<i>Leptodea fragilis</i>	21.60	6.20	11.70
BE	6/30/92	<i>Leptodea fragilis</i>	68.10	23.15	41.25
BE	6/30/92	<i>Leptodea fragilis</i>	109.60	35.10	65.95
BE	6/30/92	<i>Leptodea fragilis</i>	54.25	17.35	34.00
DW	6/9/92	<i>Leptodea leptodon</i>	38.55	12.45	30.75
DW	6/9/92	<i>Lampsilis ovata ventricosa</i>	71.70	35.50	54.95
BW	6/18/92	<i>Lampsilis ovata ventricosa</i>	98.55	47.65	68.10
EE	6/25/92	<i>Lampsilis ovata ventricosa</i>	119.30	36.85	65.85
EM	6/23/92	<i>Ligumia recta</i>	45.75	11.85	18.85
EE	6/25/92	<i>Ligumia recta</i>	79.30	24.55	38.35
CE	6/30/92	<i>Ligumia recta</i>	60.10	14.50	28.30
CE	6/30/92	<i>Ligumia recta</i>	47.95	13.20	22.45
BE	6/30/92	<i>Ligumia recta</i>	99.60	32.40	43.10
DM	6/4/92	<i>Lampsilis radiata siliquioidea</i>	18.02	4.92	9.97
DW	6/9/92	<i>Lampsilis radiata siliquioidea</i>	12.40	4.65	10.30
DW	6/9/92	<i>Lampsilis radiata siliquioidea</i>	18.20	4.60	9.65
EM	6/23/92	<i>Lampsilis radiata siliquioidea</i>	71.90	32.35	52.15
DM	6/4/92	<i>Obovaria olivaria</i>	61.77	39.20	55.68
EM	6/23/92	<i>Obovaria olivaria</i>	76.95	45.15	73.50
AE	6/24/92	<i>Obovaria olivaria</i>	54.15	32.00	45.70
AM	6/24/92	<i>Obovaria olivaria</i>	56.85	33.70	46.20
AM	6/24/92	<i>Obovaria olivaria</i>	15.90	8.35	11.50
DE	6/25/92	<i>Obovaria olivaria</i>	49.85	28.90	45.45
CE	6/30/92	<i>Obovaria olivaria</i>	70.55	46.00	60.00
BE	6/30/92	<i>Obovaria olivaria</i>	76.55	47.75	61.15
DW	6/9/92	<i>Oblivaria reflexa</i>	41.60	29.60	36.25
BM	6/18/92	<i>Oblivaria reflexa</i>	30.95	13.15	26.60
BM	6/18/92	<i>Oblivaria reflexa</i>	15.75	13.95	8.15
BW	6/18/92	<i>Oblivaria reflexa</i>	41.90	30.30	35.90
AE	6/24/92	<i>Oblivaria reflexa</i>	47.10	30.25	38.65
AE	6/24/92	<i>Oblivaria reflexa</i>	21.30	14.30	18.00
AM	6/24/92	<i>Oblivaria reflexa</i>	30.80	19.05	23.45
AM	6/24/92	<i>Oblivaria reflexa</i>	30.15	18.95	24.15
EE	6/25/92	<i>Oblivaria reflexa</i>	37.15	24.50	30.70
EE	6/25/92	<i>Oblivaria reflexa</i>	22.30	12.30	16.30
AW	7/1/92	<i>Oblivaria reflexa</i>	27.60	17.45	22.60
AW	7/1/92	<i>Oblivaria reflexa</i>	27.30	18.25	22.70

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
AW	7/1/92	<i>Obliquaria reflexa</i>	20.50	11.05	14.85
AW	7/1/92	<i>Obliquaria reflexa</i>	48.20	22.30	34.80
AW	7/1/92	<i>Obliquaria reflexa</i>	21.05	11.45	15.60
BE	6/30/92	<i>Obliquaria reflexa</i>	39.25	26.90	31.35
BE	6/30/92	<i>Obliquaria reflexa</i>	31.30	11.25	26.40
BE	6/30/92	<i>Obliquaria reflexa</i>	29.20	16.65	24.45
DW	6/9/92	<i>Proptera alata</i>	23.30	8.15	22.55
EM	6/23/92	<i>Proptera alata</i>	89.70	24.90	76.95
EM	6/23/92	<i>Proptera alata</i>	73.45	20.80	69.40
AE	6/24/92	<i>Proptera alata</i>	93.20	30.50	89.80
AM	6/24/92	<i>Proptera alata</i>	163.55	57.05	117.30
AW	7/1/92	<i>Proptera alata</i>	152.50	40.65	94.55
AW	7/1/92	<i>Proptera alata</i>	136.50	39.05	90.00
AW	7/1/92	<i>Proptera alata</i>	58.10	15.50	32.85
AW	7/1/92	<i>Proptera alata</i>	116.35	26.10	97.90
BE	6/30/92	<i>Proptera alata</i>	31.10	7.75	22.50
EM	6/23/92	<i>Pleuobema sintoxia</i>	75.50	61.60	41.30
AW	7/1/92	<i>Pleuobema sintoxia</i>	33.75	23.35	34.60
BE	6/30/92	<i>Pleuobema sintoxia</i>	56.55	39.50	50.90
DM	6/4/92	<i>Plagiola (Epioblasma) triquetra</i>	29.30	15.41	19.72
DM	6/4/92	<i>Plagiola (Epioblasma) triquetra</i>	13.80	6.76	10.32
DM	6/4/92	<i>Plagiola (Epioblasma) triquetra</i>	23.25	12.64	15.70
DW	6/9/92	<i>Plagiola (Epioblasma) triquetra</i>	30.05	16.25	23.65
CM	6/17/92	<i>Plagiola (Epioblasma) triquetra</i>	35.85	20.75	24.65
CW	6/17/92	<i>Plagiola (Epioblasma) triquetra</i>	35.05	18.50	20.95
DE	6/25/92	<i>Plagiola (Epioblasma) triquetra</i>	36.40	20.45	22.35
BE	6/30/92	<i>Plagiola (Epioblasma) triquetra</i>	36.05	20.50	20.90
BE	6/30/92	<i>Plagiola (Epioblasma) triquetra</i>	20.85	10.30	13.65
DM	6/4/92	<i>Quadrula fragosa</i>	72.09	43.61	65.90
DW	6/9/92	<i>Quadrula metanevra</i>	42.60	27.20	40.15
CM	6/17/92	<i>Quadrula metanevra</i>	71.10	40.05	58.75
CM	6/17/92	<i>Quadrula metanevra</i>	74.40	44.35	59.65
CW	6/17/92	<i>Quadrula metanevra</i>	52.55	31.95	46.20
BM	6/18/92	<i>Quadrula metanevra</i>	54.00	35.40	51.00
EM	6/23/92	<i>Quadrula metanevra</i>	56.50	35.55	51.45
AM	6/24/92	<i>Quadrula metanevra</i>	70.70	42.75	63.70
DE	6/25/92	<i>Quadrula metanevra</i>	44.80	28.15	39.20
DE	6/25/92	<i>Quadrula metanevra</i>	51.35	32.70	46.55
DE	6/25/92	<i>Quadrula metanevra</i>	63.85	39.50	57.15
DE	6/25/92	<i>Quadrula metanevra</i>	63.25	43.95	59.40
CE	6/30/92	<i>Quadrula metanevra</i>	34.25	21.50	31.25
BE	6/30/92	<i>Quadrula metanevra</i>	83.90	45.50	74.55
BE	6/30/92	<i>Quadrula metanevra</i>	76.90	44.45	66.90
BE	6/30/92	<i>Quadrula metanevra</i>	64.25	42.80	59.50
BE	6/30/92	<i>Quadrula metanevra</i>	64.25	41.95	54.95
DM	6/4/92	<i>Quadrula nodulata</i>	20.65	13.05	18.70
DM	6/4/92	<i>Quadrula pustulosa</i>	59.65	38.55	58.15
DM	6/4/92	<i>Quadrula pustulosa</i>	32.80	21.15	30.80
DW	6/9/92	<i>Quadrula pustulosa</i>	32.15	19.00	29.35
CW	6/17/92	<i>Quadrula pustulosa</i>	6.05	3.20	5.00
BM	6/18/92	<i>Quadrula pustulosa</i>	51.25	33.50	47.70
BW	6/18/92	<i>Quadrula pustulosa</i>	66.60	43.20	61.55
EM	6/23/92	<i>Quadrula pustulosa</i>	75.30	48.65	67.20

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
EM	6/23/92	<i>Quadrula pustulosa</i>	75.05	49.85	69.10
EM	6/23/92	<i>Quadrula pustulosa</i>	19.40	11.45	17.30
EM	6/23/92	<i>Quadrula pustulosa</i>	34.80	22.45	33.00
AE	6/24/92	<i>Quadrula pustulosa</i>	43.05	27.40	42.60
AE	6/24/92	<i>Quadrula pustulosa</i>	72.35	46.00	69.95
AE	6/24/92	<i>Quadrula pustulosa</i>	13.85	7.50	11.90
AE	6/24/92	<i>Quadrula pustulosa</i>	44.70	28.70	45.00
AE	6/24/92	<i>Quadrula pustulosa</i>	76.85	44.25	69.45
AE	6/24/92	<i>Quadrula pustulosa</i>	16.55	9.85	14.35
AM	6/24/92	<i>Quadrula pustulosa</i>	64.45	32.85	67.00
AM	6/24/92	<i>Quadrula pustulosa</i>	29.60	20.20	29.60
AM	6/24/92	<i>Quadrula pustulosa</i>	47.35	30.95	44.60
AM	6/24/92	<i>Quadrula pustulosa</i>	53.15	32.10	51.55
AM	6/24/92	<i>Quadrula pustulosa</i>	31.10	20.45	28.70
AM	6/24/92	<i>Quadrula pustulosa</i>	49.40	31.00	45.49
AM	6/24/92	<i>Quadrula pustulosa</i>	23.50	24.55	20.90
AM	6/24/92	<i>Quadrula pustulosa</i>	16.35	10.55	14.65
AM	6/24/92	<i>Quadrula pustulosa</i>	46.10	31.00	43.30
AM	6/24/92	<i>Quadrula pustulosa</i>	52.75	31.35	50.00
AM	6/24/92	<i>Quadrula pustulosa</i>	42.60	29.05	42.55
AM	6/24/92	<i>Quadrula pustulosa</i>	33.55	23.80	32.55
DE	6/25/92	<i>Quadrula pustulosa</i>	46.50	32.25	45.10
DE	6/25/92	<i>Quadrula pustulosa</i>	40.60	27.85	37.80
DE	6/25/92	<i>Quadrula pustulosa</i>	23.60	13.85	20.40
DE	6/25/92	<i>Quadrula pustulosa</i>	55.45	37.10	54.50
DE	6/25/92	<i>Quadrula pustulosa</i>	37.65	24.50	33.20
DE	6/25/92	<i>Quadrula pustulosa</i>	62.55	37.10	60.30
DE	6/25/92	<i>Quadrula pustulosa</i>	18.15	11.90	16.70
EE	6/25/92	<i>Quadrula pustulosa</i>	19.55	11.55	17.65
EE	6/25/92	<i>Quadrula pustulosa</i>	15.70	9.00	14.15
EE	6/25/92	<i>Quadrula pustulosa</i>	41.75	26.25	38.30
AW	7/1/92	<i>Quadrula pustulosa</i>	23.75	14.35	21.65
AW	7/1/92	<i>Quadrula pustulosa</i>	40.15	29.10	38.80
AW	7/1/92	<i>Quadrula pustulosa</i>	18.00	12.10	17.00
AW	7/1/92	<i>Quadrula pustulosa</i>	19.00	11.10	17.10
AW	7/1/92	<i>Quadrula pustulosa</i>	24.70	15.90	22.65
AW	7/1/92	<i>Quadrula pustulosa</i>	12.95	7.10	11.25
AW	7/1/92	<i>Quadrula pustulosa</i>	38.65	25.15	37.70
AW	7/1/92	<i>Quadrula pustulosa</i>	12.45	6.60	11.00
AW	7/1/92	<i>Quadrula pustulosa</i>	14.80	9.00	12.80
BE	6/30/92	<i>Quadrula pustulosa</i>	63.60	38.55	64.90
BE	6/30/92	<i>Quadrula pustulosa</i>	47.45	28.35	46.20
BE	6/30/92	<i>Quadrula pustulosa</i>	46.80	24.80	43.00
BE	6/30/92	<i>Quadrula pustulosa</i>	79.80	40.95	74.15
BE	6/30/92	<i>Quadrula pustulosa</i>	43.55	28.25	40.60
BE	6/30/92	<i>Quadrula pustulosa</i>	82.95	44.10	84.15
BE	6/30/92	<i>Quadrula pustulosa</i>	16.00	9.80	14.00
BE	6/30/92	<i>Quadrula pustulosa</i>	40.65	26.55	39.45
AW	7/1/92	<i>Quadrula quadrula</i>	46.55	30.05	43.40
DM	6/4/92	<i>Truncilla donaciformes</i>	22.60	12.60	16.20
CM	6/17/92	<i>Truncilla donaciformes</i>	14.90	6.80	9.60
CM	6/17/92	<i>Truncilla donaciformes</i>	17.65	7.20	11.00
CW	6/17/92	<i>Truncilla donaciformes</i>	15.50	7.35	10.45

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
BM	6/18/92	<i>Truncilla donaciformes</i>	23.45	12.30	16.55
BM	6/18/92	<i>Truncilla donaciformes</i>	19.95	8.05	13.65
BM	6/18/92	<i>Truncilla donaciformes</i>	24.05	10.90	15.60
BM	6/18/92	<i>Truncilla donaciformes</i>	22.10	13.50	15.70
BW	6/18/92	<i>Truncilla donaciformes</i>	22.40	12.00	15.95
BW	6/18/92	<i>Truncilla donaciformes</i>	23.85	13.40	16.70
EM	6/23/92	<i>Truncilla donaciformes</i>	21.30	9.10	13.05
EM	6/23/92	<i>Truncilla donaciformes</i>	19.35	10.00	12.50
EM	6/23/92	<i>Truncilla donaciformes</i>	26.05	15.55	17.85
EM	6/23/92	<i>Truncilla donaciformes</i>	14.75	6.50	10.00
EM	6/23/92	<i>Truncilla donaciformes</i>	32.40	19.15	23.65
EM	6/23/92	<i>Truncilla donaciformes</i>	23.20	13.15	15.80
EM	6/23/92	<i>Truncilla donaciformes</i>	21.70	11.80	16.20
EM	6/23/92	<i>Truncilla donaciformes</i>	23.35	11.10	14.85
EM	6/23/92	<i>Truncilla donaciformes</i>	24.60	17.75	13.80
EM	6/23/92	<i>Truncilla donaciformes</i>	30.30	16.25	21.15
EM	6/23/92	<i>Truncilla donaciformes</i>	22.70	11.60	15.40
EM	6/23/92	<i>Truncilla donaciformes</i>	22.35	13.40	16.40
AE	6/24/92	<i>Truncilla donaciformes</i>	21.70	11.05	15.15
AE	6/24/92	<i>Truncilla donaciformes</i>	20.30	11.70	15.90
AE	6/24/92	<i>Truncilla donaciformes</i>	26.60	15.75	19.05
AE	6/24/92	<i>Truncilla donaciformes</i>	24.60	14.10	17.85
AE	6/24/92	<i>Truncilla donaciformes</i>	30.80	16.80	23.35
AE	6/24/92	<i>Truncilla donaciformes</i>	16.50	7.30	10.60
AE	6/24/92	<i>Truncilla donaciformes</i>	28.80	16.90	20.95
AE	6/24/92	<i>Truncilla donaciformes</i>	24.60	13.25	17.75
AM	6/24/92	<i>Truncilla donaciformes</i>	29.05	15.10	26.35
AM	6/24/92	<i>Truncilla donaciformes</i>	14.00	6.25	11.30
AM	6/24/92	<i>Truncilla donaciformes</i>	19.70	11.15	15.95
AM	6/24/92	<i>Truncilla donaciformes</i>	19.60	10.95	15.40
AM	6/24/92	<i>Truncilla donaciformes</i>	20.30	11.70	15.20
AM	6/24/92	<i>Truncilla donaciformes</i>	21.90	12.15	18.35
AM	6/24/92	<i>Truncilla donaciformes</i>	21.80	12.20	17.55
AM	6/24/92	<i>Truncilla donaciformes</i>	21.20	14.20	17.35
AM	6/24/92	<i>Truncilla donaciformes</i>	25.75	14.75	20.40
AM	6/24/92	<i>Truncilla donaciformes</i>	27.80	14.70	21.25
AM	6/24/92	<i>Truncilla donaciformes</i>	28.10	16.50	20.70
AM	6/24/92	<i>Truncilla donaciformes</i>	20.40	14.60	18.65
AM	6/24/92	<i>Truncilla donaciformes</i>	19.35	14.85	17.55
AM	6/24/92	<i>Truncilla donaciformes</i>	39.15	18.00	26.10
AM	6/24/92	<i>Truncilla donaciformes</i>	20.35	11.15	13.65
AM	6/24/92	<i>Truncilla donaciformes</i>	20.25	12.95	14.55
AM	6/24/92	<i>Truncilla donaciformes</i>	23.10	12.01	15.55
AM	6/24/92	<i>Truncilla donaciformes</i>	22.30	13.40	15.40
AM	6/24/92	<i>Truncilla donaciformes</i>	22.55	12.60	15.65
AM	6/24/92	<i>Truncilla donaciformes</i>	27.65	14.90	20.25
AM	6/24/92	<i>Truncilla donaciformes</i>	19.05	10.80	14.05
AM	6/24/92	<i>Truncilla donaciformes</i>	23.60	16.90	14.20
AM	6/24/92	<i>Truncilla donaciformes</i>	19.95	12.75	14.05
AM	6/24/92	<i>Truncilla donaciformes</i>	24.35	14.30	17.50
AM	6/24/92	<i>Truncilla donaciformes</i>	22.90	13.30	16.40
AM	6/24/92	<i>Truncilla donaciformes</i>	21.40	11.60	15.40
AM	6/24/92	<i>Truncilla donaciformes</i>	23.75	15.05	17.50

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
AM	6/24/92	<i>Truncilla donaciformes</i>	35.90	19.50	25.00
AM	6/24/92	<i>Truncilla donaciformes</i>	27.80	14.75	19.45
AM	6/24/92	<i>Truncilla donaciformes</i>	25.05	14.80	18.15
AM	6/24/92	<i>Truncilla donaciformes</i>	24.20	11.95	17.00
AM	6/24/92	<i>Truncilla donaciformes</i>	28.05	16.30	20.05
AM	6/24/92	<i>Truncilla donaciformes</i>	24.50	14.70	16.85
AM	6/24/92	<i>Truncilla donaciformes</i>	28.40	15.20	18.55
DE	6/25/92	<i>Truncilla donaciformes</i>	25.35	15.00	17.15
DE	6/25/92	<i>Truncilla donaciformes</i>	29.15	18.15	22.10
DE	6/25/92	<i>Truncilla donaciformes</i>	22.80	12.15	15.15
DE	6/25/92	<i>Truncilla donaciformes</i>	26.15	14.40	17.75
DE	6/25/92	<i>Truncilla donaciformes</i>	21.75	11.60	15.20
DE	6/25/92	<i>Truncilla donaciformes</i>	24.40	10.05	17.75
DE	6/25/92	<i>Truncilla donaciformes</i>	22.90	12.90	16.95
DE	6/25/92	<i>Truncilla donaciformes</i>	20.55	12.40	15.90
DE	6/25/92	<i>Truncilla donaciformes</i>	19.90		13.65
EE	6/25/92	<i>Truncilla donaciformes</i>	20.30	11.10	14.15
EE	6/25/92	<i>Truncilla donaciformes</i>	21.65	10.40	14.60
EE	6/25/92	<i>Truncilla donaciformes</i>	18.75	8.65	12.75
EE	6/25/92	<i>Truncilla donaciformes</i>	25.65	14.10	17.50
EE	6/25/92	<i>Truncilla donaciformes</i>	15.65	7.20	11.20
EE	6/25/92	<i>Truncilla donaciformes</i>	24.70	14.50	17.70
EE	6/25/92	<i>Truncilla donaciformes</i>	24.45	12.10	17.30
EE	6/25/92	<i>Truncilla donaciformes</i>	21.65	12.00	16.05
EE	6/25/92	<i>Truncilla donaciformes</i>	20.20	11.20	14.95
EE	6/25/92	<i>Truncilla donaciformes</i>	22.40	12.00	17.35
AW	7/1/92	<i>Truncilla donaciformes</i>	21.10	11.80	15.80
AW	7/1/92	<i>Truncilla donaciformes</i>	15.50	8.35	11.60
AW	7/1/92	<i>Truncilla donaciformes</i>	23.80	13.50	18.45
AW	7/1/92	<i>Truncilla donaciformes</i>	19.80	12.40	15.40
AW	7/1/92	<i>Truncilla donaciformes</i>	20.80	12.85	16.45
AW	7/1/92	<i>Truncilla donaciformes</i>	31.20	15.70	20.70
AW	7/1/92	<i>Truncilla donaciformes</i>	27.70	15.70	19.60
AW	7/1/92	<i>Truncilla donaciformes</i>	17.45	9.75	13.70
AW	7/1/92	<i>Truncilla donaciformes</i>	17.95	9.25	18.10
AW	7/1/92	<i>Truncilla donaciformes</i>	23.70	14.15	17.20
AW	7/1/92	<i>Truncilla donaciformes</i>	19.70	12.50	15.55
AW	7/1/92	<i>Truncilla donaciformes</i>	19.35	10.35	14.00
AW	7/1/92	<i>Truncilla donaciformes</i>	25.60	13.25	18.25
AW	7/1/92	<i>Truncilla donaciformes</i>	26.75	13.75	18.55
AW	7/1/92	<i>Truncilla donaciformes</i>	21.25	11.80	15.20
AW	7/1/92	<i>Truncilla donaciformes</i>	19.00	10.95	13.70
AW	7/1/92	<i>Truncilla donaciformes</i>	17.35	10.10	12.30
AW	7/1/92	<i>Truncilla donaciformes</i>	24.45	13.85	16.10
AW	7/1/92	<i>Truncilla donaciformes</i>	39.15	22.90	26.35
AW	7/1/92	<i>Truncilla donaciformes</i>	30.00	18.10	20.55
AW	7/1/92	<i>Truncilla donaciformes</i>	18.00	9.20	12.05
AW	7/1/92	<i>Truncilla donaciformes</i>	35.40	17.50	23.50
AW	7/1/92	<i>Truncilla donaciformes</i>	24.70	14.35	17.40
AW	7/1/92	<i>Truncilla donaciformes</i>	15.45	8.90	11.75
BE	6/30/92	<i>Truncilla donaciformes</i>	17.60	8.90	12.90
BE	6/30/92	<i>Truncilla donaciformes</i>	26.50	14.05	18.05
DM	6/4/92	<i>Truncilla truncata</i>	41.88	28.62	38.50

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
DM	6/4/92	<i>Truncilla truncata</i>	39.90	23.64	34.60
DM	6/4/92	<i>Truncilla truncata</i>	26.56	16.62	22.50
DM	6/4/92	<i>Truncilla truncata</i>	16.30	9.06	13.87
DM	6/4/92	<i>Truncilla truncata</i>	33.54	18.85	26.62
DM	6/4/92	<i>Truncilla truncata</i>	18.14	10.42	14.24
DM	6/4/92	<i>Truncilla truncata</i>	20.75	11.55	16.00
DM	6/4/92	<i>Truncilla truncata</i>	49.70	28.85	39.38
DM	6/4/92	<i>Truncilla truncata</i>	37.45	22.06	33.15
DM	6/4/92	<i>Truncilla truncata</i>	49.06	31.00	42.88
DM	6/4/92	<i>Truncilla truncata</i>	45.78	29.60	38.68
DM	6/4/92	<i>Truncilla truncata</i>	46.00	28.15	40.70
DM	6/4/92	<i>Truncilla truncata</i>	39.97	22.24	31.85
DM	6/4/92	<i>Truncilla truncata</i>	34.04	17.32	27.78
DM	6/4/92	<i>Truncilla truncata</i>	41.35	22.75	35.00
DM	6/4/92	<i>Truncilla truncata</i>	58.30	36.30	45.55
DM	6/4/92	<i>Truncilla truncata</i>	26.49	13.65	20.38
DM	6/4/92	<i>Truncilla truncata</i>	14.04	7.12	9.95
DM	6/4/92	<i>Truncilla truncata</i>	14.34	8.75	12.51
DM	6/4/92	<i>Truncilla truncata</i>	42.84	29.34	38.57
DM	6/4/92	<i>Truncilla truncata</i>	41.06	21.92	33.45
DM	6/4/92	<i>Truncilla truncata</i>	42.76	23.57	34.17
DM	6/4/92	<i>Truncilla truncata</i>	38.95	24.35	34.02
DM	6/4/92	<i>Truncilla truncata</i>	40.78	27.86	34.80
DM	6/4/92	<i>Truncilla truncata</i>	33.46	20.87	29.10
DM	6/4/92	<i>Truncilla truncata</i>	43.60	23.00	33.55
DM	6/4/92	<i>Truncilla truncata</i>	27.30	14.90	20.30
DM	6/4/92	<i>Truncilla truncata</i>	45.45	26.50	40.85
DM	6/4/92	<i>Truncilla truncata</i>	42.20	23.75	35.40
DM	6/4/92	<i>Truncilla truncata</i>	42.30	28.10	37.15
DM	6/4/92	<i>Truncilla truncata</i>	38.25	21.40	30.65
DM	6/4/92	<i>Truncilla truncata</i>	42.80	25.70	37.10
DM	6/4/92	<i>Truncilla truncata</i>	18.70	10.15	14.65
DM	6/4/92	<i>Truncilla truncata</i>	35.70	21.80	31.50
DM	6/4/92	<i>Truncilla truncata</i>	52.00	31.60	39.75
DM	6/4/92	<i>Truncilla truncata</i>	22.50	11.75	15.00
DM	6/4/92	<i>Truncilla truncata</i>	46.95	29.75	40.50
DM	6/4/92	<i>Truncilla truncata</i>	23.80	14.00	20.05
DM	6/4/92	<i>Truncilla truncata</i>	38.65	23.55	32.90
DM	6/4/92	<i>Truncilla truncata</i>	50.90	30.65	44.80
DM	6/4/92	<i>Truncilla truncata</i>	32.10	12.50	20.65
DM	6/4/92	<i>Truncilla truncata</i>	34.30	20.70	28.00
DM	6/4/92	<i>Truncilla truncata</i>	43.90	29.70	37.35
DM	6/4/92	<i>Truncilla truncata</i>	12.15	5.75	8.15
DM	6/4/92	<i>Truncilla truncata</i>	19.70	9.75	15.20
DM	6/4/92	<i>Truncilla truncata</i>	37.00	22.45	29.65
DM	6/4/92	<i>Truncilla truncata</i>	14.05	5.75	9.55
DM	6/4/92	<i>Truncilla truncata</i>	40.30	27.85	35.60
DM	6/4/92	<i>Truncilla truncata</i>	23.15	13.30	18.60
DM	6/4/92	<i>Truncilla truncata</i>	40.50	27.25	36.30
DM	6/4/92	<i>Truncilla truncata</i>	31.30	20.70	30.10
DW	6/9/92	<i>Truncilla truncata</i>	41.85	22.75	34.60
DW	6/9/92	<i>Truncilla truncata</i>	43.05	25.05	36.55
DW	6/9/92	<i>Truncilla truncata</i>	53.95	27.75	43.85

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
CM	6/17/92	<i>Truncilla truncata</i>	15.35	6.30	10.55
CM	6/17/92	<i>Truncilla truncata</i>	14.70	11.85	10.35
CM	6/17/92	<i>Truncilla truncata</i>	12.20	6.10	8.75
CM	6/17/92	<i>Truncilla truncata</i>	14.45	7.45	10.80
CM	6/17/92	<i>Truncilla truncata</i>	20.70	11.10	16.25
CM	6/17/92	<i>Truncilla truncata</i>	16.90	8.75	12.25
CM	6/17/92	<i>Truncilla truncata</i>	15.45	7.50	11.10
CM	6/17/92	<i>Truncilla truncata</i>	39.60	22.65	34.20
CM	6/17/92	<i>Truncilla truncata</i>	16.15	7.80	11.40
CW	6/17/92	<i>Truncilla truncata</i>	43.00	25.05	35.65
CW	6/17/92	<i>Truncilla truncata</i>	40.70	21.60	33.75
CW	6/17/92	<i>Truncilla truncata</i>	41.25	19.85	30.65
CW	6/17/92	<i>Truncilla truncata</i>	15.70	6.85	10.90
CW	6/17/92	<i>Truncilla truncata</i>	12.35	11.05	14.45
CW	6/17/92	<i>Truncilla truncata</i>	20.70	10.75	13.75
CW	6/17/92	<i>Truncilla truncata</i>	35.55	18.30	26.25
CW	6/17/92	<i>Truncilla truncata</i>	12.30	5.85	8.45
BM	6/18/92	<i>Truncilla truncata</i>	7.25	2.50	4.60
BM	6/18/92	<i>Truncilla truncata</i>	22.95	11.90	17.55
BM	6/18/92	<i>Truncilla truncata</i>	12.30	9.45	14.05
BM	6/18/92	<i>Truncilla truncata</i>	46.20	25.40	39.05
BM	6/18/92	<i>Truncilla truncata</i>	44.85	25.55	38.85
BM	6/18/92	<i>Truncilla truncata</i>	15.25	8.40	11.30
BM	6/18/92	<i>Truncilla truncata</i>	24.45	13.40	21.10
BW	6/18/92	<i>Truncilla truncata</i>	47.90	26.75	37.10
BW	6/18/92	<i>Truncilla truncata</i>	44.15	26.10	38.15
BW	6/18/92	<i>Truncilla truncata</i>	40.85	23.50	34.65
BW	6/18/92	<i>Truncilla truncata</i>	41.60	22.45	32.95
BW	6/18/92	<i>Truncilla truncata</i>	39.00	23.95	34.65
BW	6/18/92	<i>Truncilla truncata</i>	37.00	20.40	31.00
BW	6/18/92	<i>Truncilla truncata</i>	32.10	18.40	25.15
BW	6/18/92	<i>Truncilla truncata</i>	34.90	17.60	26.60
BW	6/18/92	<i>Truncilla truncata</i>	45.30	29.40	40.00
BW	6/18/92	<i>Truncilla truncata</i>	44.20	23.65	36.20
BW	6/18/92	<i>Truncilla truncata</i>	40.85	22.60	34.70
BW	6/18/92	<i>Truncilla truncata</i>	16.30	10.90	8.10
BW	6/18/92	<i>Truncilla truncata</i>	39.40	20.30	30.95
BW	6/18/92	<i>Truncilla truncata</i>	35.50	18.70	27.25
BW	6/18/92	<i>Truncilla truncata</i>	20.90	12.15	16.95
BW	6/18/92	<i>Truncilla truncata</i>	23.80	12.65	18.05
BW	6/18/92	<i>Truncilla truncata</i>	14.40	7.35	9.90
BW	6/18/92	<i>Truncilla truncata</i>	44.10	22.25	34.10
BW	6/18/92	<i>Truncilla truncata</i>	52.10	29.90	43.65
BW	6/18/92	<i>Truncilla truncata</i>	45.95	22.75	34.50
BW	6/18/92	<i>Truncilla truncata</i>	40.10	24.20	33.90
BW	6/18/92	<i>Truncilla truncata</i>	38.55	21.10	30.45
BW	6/18/92	<i>Truncilla truncata</i>	20.35	10.30	15.70
BW	6/18/92	<i>Truncilla truncata</i>	50.75	27.20	40.70
BW	6/18/92	<i>Truncilla truncata</i>	43.55	24.65	33.70
BW	6/18/92	<i>Truncilla truncata</i>	32.50	20.80	28.23
BW	6/18/92	<i>Truncilla truncata</i>	38.50	22.80	32.45
BW	6/18/92	<i>Truncilla truncata</i>	42.05	24.20	34.00
BW	6/18/92	<i>Truncilla truncata</i>	18.20	9.60	14.75

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
BW	6/18/92	<i>Truncilla truncata</i>	46.10	25.90	36.60
BW	6/18/92	<i>Truncilla truncata</i>	22.75	12.25	17.70
BW	6/18/92	<i>Truncilla truncata</i>	16.50	8.70	11.40
BW	6/18/92	<i>Truncilla truncata</i>	39.00	23.30	32.30
BW	6/18/92	<i>Truncilla truncata</i>	13.00	6.60	10.05
EM	6/23/92	<i>Truncilla truncata</i>	51.40	32.50	42.85
EM	6/23/92	<i>Truncilla truncata</i>	29.45	13.95	25.00
EM	6/23/92	<i>Truncilla truncata</i>	30.80	12.70	25.20
EM	6/23/92	<i>Truncilla truncata</i>	30.30	11.95	25.25
EM	6/23/92	<i>Truncilla truncata</i>	54.05	34.95	42.05
EM	6/23/92	<i>Truncilla truncata</i>	44.05	27.10	36.45
EM	6/23/92	<i>Truncilla truncata</i>	61.40	40.55	49.60
EM	6/23/92	<i>Truncilla truncata</i>	49.95	24.25	37.85
EM	6/23/92	<i>Truncilla truncata</i>	41.45	23.75	33.90
EM	6/23/92	<i>Truncilla truncata</i>	28.60	12.55	23.50
EM	6/23/92	<i>Truncilla truncata</i>	39.25	22.45	29.35
EM	6/23/92	<i>Truncilla truncata</i>	48.40	33.10	40.35
EM	6/23/92	<i>Truncilla truncata</i>	54.60	31.75	45.60
EM	6/23/92	<i>Truncilla truncata</i>	39.35	22.20	34.05
EM	6/23/92	<i>Truncilla truncata</i>	32.75	12.05	25.20
EM	6/23/92	<i>Truncilla truncata</i>	37.70	25.10	31.85
EM	6/23/92	<i>Truncilla truncata</i>	29.45	12.25	25.80
EM	6/23/92	<i>Truncilla truncata</i>	30.05	19.25	23.85
EM	6/23/92	<i>Truncilla truncata</i>	30.95	19.65	25.75
EM	6/23/92	<i>Truncilla truncata</i>	27.05	12.05	22.75
EM	6/23/92	<i>Truncilla truncata</i>	43.05	27.05	34.35
EM	6/23/92	<i>Truncilla truncata</i>	19.35	11.50	14.95
EM	6/23/92	<i>Truncilla truncata</i>	49.65	32.65	43.55
EM	6/23/92	<i>Truncilla truncata</i>	42.00	27.45	37.35
EM	6/23/92	<i>Truncilla truncata</i>	34.15	21.15	31.15
EM	6/23/92	<i>Truncilla truncata</i>	49.10	28.70	39.05
EM	6/23/92	<i>Truncilla truncata</i>	52.75	32.50	42.60
EM	6/23/92	<i>Truncilla truncata</i>	62.20	37.45	48.10
EM	6/23/92	<i>Truncilla truncata</i>	49.40	26.20	38.10
EM	6/23/92	<i>Truncilla truncata</i>	45.30	26.85	38.20
EM	6/23/92	<i>Truncilla truncata</i>	54.35	34.40	45.50
EM	6/23/92	<i>Truncilla truncata</i>	48.50	28.90	39.15
EM	6/23/92	<i>Truncilla truncata</i>	40.30	25.15	36.10
EM	6/23/92	<i>Truncilla truncata</i>	19.30	11.55	15.45
EM	6/23/92	<i>Truncilla truncata</i>	63.20	33.75	48.50
EM	6/23/92	<i>Truncilla truncata</i>	26.15	14.30	21.00
EM	6/23/92	<i>Truncilla truncata</i>	35.15	21.15	29.15
EM	6/23/92	<i>Truncilla truncata</i>	15.60	7.65	10.80
EM	6/23/92	<i>Truncilla truncata</i>	54.90	34.55	43.75
EM	6/23/92	<i>Truncilla truncata</i>	40.55	36.00	32.60
EM	6/23/92	<i>Truncilla truncata</i>	19.80	10.65	14.50
EM	6/23/92	<i>Truncilla truncata</i>	46.94	27.20	37.75
EM	6/23/92	<i>Truncilla truncata</i>	36.75	20.50	31.90
EM	6/23/92	<i>Truncilla truncata</i>	54.20	34.90	49.70
EM	6/23/92	<i>Truncilla truncata</i>	24.70	15.40	20.20
EM	6/23/92	<i>Truncilla truncata</i>	29.80	19.10	25.90
EM	6/23/92	<i>Truncilla truncata</i>	23.20	12.80	18.55
EM	6/23/92	<i>Truncilla truncata</i>	34.20	19.20	27.50

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
EM	6/23/92	<i>Truncilla truncata</i>	29.45	17.20	23.90
EM	6/23/92	<i>Truncilla truncata</i>	29.75	19.00	25.70
EM	6/23/92	<i>Truncilla truncata</i>	44.65	25.80	37.30
AE	6/24/92	<i>Truncilla truncata</i>	69.55	38.05	51.25
AE	6/24/92	<i>Truncilla truncata</i>	39.25	23.45	33.10
AE	6/24/92	<i>Truncilla truncata</i>	23.05	12.45	13.05
AE	6/24/92	<i>Truncilla truncata</i>	55.65	37.95	48.20
AE	6/24/92	<i>Truncilla truncata</i>	33.65	20.30	28.30
AE	6/24/92	<i>Truncilla truncata</i>	32.65	17.80	27.05
AE	6/24/92	<i>Truncilla truncata</i>	21.36	11.85	12.20
AE	6/24/92	<i>Truncilla truncata</i>	26.00	14.60	20.60
AE	6/24/92	<i>Truncilla truncata</i>	29.00	16.80	23.35
AE	6/24/92	<i>Truncilla truncata</i>	22.25	11.95	12.40
AE	6/24/92	<i>Truncilla truncata</i>	26.10	13.00	20.45
AE	6/24/92	<i>Truncilla truncata</i>	13.10	6.10	9.15
AE	6/24/92	<i>Truncilla truncata</i>	47.80	28.80	38.45
AE	6/24/92	<i>Truncilla truncata</i>	22.15	12.25	17.65
AE	6/24/92	<i>Truncilla truncata</i>	22.45	11.80	17.05
AE	6/24/92	<i>Truncilla truncata</i>	49.40	33.35	44.30
AE	6/24/92	<i>Truncilla truncata</i>	39.55	24.05	32.60
AE	6/24/92	<i>Truncilla truncata</i>	45.15	23.00	33.65
AE	6/24/92	<i>Truncilla truncata</i>	53.30	37.20	46.05
AE	6/24/92	<i>Truncilla truncata</i>	48.65	27.95	39.65
AE	6/24/92	<i>Truncilla truncata</i>	22.85	13.70	17.65
AE	6/24/92	<i>Truncilla truncata</i>	20.60	9.75	14.80
AE	6/24/92	<i>Truncilla truncata</i>	14.05	6.35	9.90
AE	6/24/92	<i>Truncilla truncata</i>	18.35	11.35	14.90
AE	6/24/92	<i>Truncilla truncata</i>	45.00	24.30	35.80
AE	6/24/92	<i>Truncilla truncata</i>	35.36	23.20	30.40
AE	6/24/92	<i>Truncilla truncata</i>	22.30	12.75	17.80
AE	6/24/92	<i>Truncilla truncata</i>	33.35	20.85	29.25
AE	6/24/92	<i>Truncilla truncata</i>	28.95	16.60	24.05
AE	6/24/92	<i>Truncilla truncata</i>	27.00	16.25	23.05
AE	6/24/92	<i>Truncilla truncata</i>	30.45	17.60	26.05
AE	6/24/92	<i>Truncilla truncata</i>	26.90	17.20	23.05
AE	6/24/92	<i>Truncilla truncata</i>	18.90	7.10	9.90
AE	6/24/92	<i>Truncilla truncata</i>	21.10	12.30	17.00
AE	6/24/92	<i>Truncilla truncata</i>	20.00	11.30	15.20
AE	6/24/92	<i>Truncilla truncata</i>	47.70	29.90	36.80
AE	6/24/92	<i>Truncilla truncata</i>	49.40	29.40	41.05
AE	6/24/92	<i>Truncilla truncata</i>	23.10	13.35	16.85
AE	6/24/92	<i>Truncilla truncata</i>	38.50	24.15	32.75
AE	6/24/92	<i>Truncilla truncata</i>	33.25	19.00	26.20
AE	6/24/92	<i>Truncilla truncata</i>	19.35	10.65	14.45
AE	6/24/92	<i>Truncilla truncata</i>	44.70	28.00	37.80
AE	6/24/92	<i>Truncilla truncata</i>	41.45	25.30	33.30
AE	6/24/92	<i>Truncilla truncata</i>	38.40	23.00	32.35
AE	6/24/92	<i>Truncilla truncata</i>	48.55	28.55	39.55
AE	6/24/92	<i>Truncilla truncata</i>	21.85	11.75	17.00
AE	6/24/92	<i>Truncilla truncata</i>	22.55	12.65	17.70
AE	6/24/92	<i>Truncilla truncata</i>	18.75	11.55	15.15
AE	6/24/92	<i>Truncilla truncata</i>	19.55	12.20	14.85
AE	6/24/92	<i>Truncilla truncata</i>	50.85	30.85	42.10

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
AE	6/24/92	<i>Truncilla truncata</i>	16.25	9.50	13.70
AE	6/24/92	<i>Truncilla truncata</i>	60.10	35.20	46.00
AE	6/24/92	<i>Truncilla truncata</i>	42.00	26.05	36.05
AE	6/24/92	<i>Truncilla truncata</i>	47.30	31.80	40.45
AE	6/24/92	<i>Truncilla truncata</i>	45.35	29.50	36.85
AE	6/24/92	<i>Truncilla truncata</i>	35.90	22.60	31.80
AE	6/24/92	<i>Truncilla truncata</i>	19.65	11.70	16.00
AE	6/24/92	<i>Truncilla truncata</i>	35.50	23.10	32.25
AE	6/24/92	<i>Truncilla truncata</i>	21.80	13.45	17.90
AE	6/24/92	<i>Truncilla truncata</i>	12.95	6.65	9.45
AE	6/24/92	<i>Truncilla truncata</i>	13.60	7.95	9.95
AE	6/24/92	<i>Truncilla truncata</i>	34.80	21.65	28.95
AE	6/24/92	<i>Truncilla truncata</i>	29.50	16.25	24.00
AE	6/24/92	<i>Truncilla truncata</i>	44.85	27.35	40.00
AE	6/24/92	<i>Truncilla truncata</i>	48.45	28.05	39.70
AE	6/24/92	<i>Truncilla truncata</i>	48.35	24.55	36.85
AE	6/24/92	<i>Truncilla truncata</i>	37.45	20.90	30.70
AE	6/24/92	<i>Truncilla truncata</i>	40.40	24.05	34.20
AE	6/24/92	<i>Truncilla truncata</i>	24.50	14.95	19.20
AE	6/24/92	<i>Truncilla truncata</i>	20.75	12.65	17.10
AE	6/24/92	<i>Truncilla truncata</i>	21.90	14.45	17.60
AE	6/24/92	<i>Truncilla truncata</i>	14.05	6.45	9.75
AE	6/24/92	<i>Truncilla truncata</i>	22.40	12.85	17.30
AE	6/24/92	<i>Truncilla truncata</i>	19.45	11.05	15.20
AE	6/24/92	<i>Truncilla truncata</i>	27.75	17.80	23.90
AM	6/24/92	<i>Truncilla truncata</i>	46.70	33.10	42.35
AM	6/24/92	<i>Truncilla truncata</i>	39.60	22.50	33.15
AM	6/24/92	<i>Truncilla truncata</i>	32.70	19.50	25.80
AM	6/24/92	<i>Truncilla truncata</i>	33.20	17.95	28.95
AM	6/24/92	<i>Truncilla truncata</i>	23.50	11.55	19.70
AM	6/24/92	<i>Truncilla truncata</i>	19.50	11.50	16.20
AM	6/24/92	<i>Truncilla truncata</i>	21.05	12.25	18.25
AM	6/24/92	<i>Truncilla truncata</i>	49.45	31.75	44.35
AM	6/24/92	<i>Truncilla truncata</i>	36.35	21.90	31.40
AM	6/24/92	<i>Truncilla truncata</i>	33.15	25.40	29.35
AM	6/24/92	<i>Truncilla truncata</i>	27.45	17.10	23.20
AM	6/24/92	<i>Truncilla truncata</i>	14.90	8.10	10.65
AM	6/24/92	<i>Truncilla truncata</i>	20.00	11.60	17.20
AM	6/24/92	<i>Truncilla truncata</i>	69.95	43.20	60.20
AM	6/24/92	<i>Truncilla truncata</i>	40.90	25.15	35.80
AM	6/24/92	<i>Truncilla truncata</i>	34.80	21.85	30.30
AM	6/24/92	<i>Truncilla truncata</i>	29.50	17.70	26.30
AM	6/24/92	<i>Truncilla truncata</i>	23.90	13.15	19.20
AM	6/24/92	<i>Truncilla truncata</i>	21.40	12.10	16.40
AM	6/24/92	<i>Truncilla truncata</i>	59.60	32.20	43.85
AM	6/24/92	<i>Truncilla truncata</i>	38.90	24.05	32.85
AM	6/24/92	<i>Truncilla truncata</i>	30.45	18.10	25.95
AM	6/24/92	<i>Truncilla truncata</i>	30.55	17.55	25.65
AM	6/24/92	<i>Truncilla truncata</i>	12.80	10.60	14.00
AM	6/24/92	<i>Truncilla truncata</i>	55.65	35.25	42.70
AM	6/24/92	<i>Truncilla truncata</i>	42.60	26.05	36.35
AM	6/24/92	<i>Truncilla truncata</i>	34.35	21.15	29.00
AM	6/24/92	<i>Truncilla truncata</i>	41.60	24.15	33.55

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
AM	6/24/92	<i>Truncilla truncata</i>	41.90	24.80	36.60
AM	6/24/92	<i>Truncilla truncata</i>	27.00	17.65	22.45
AM	6/24/92	<i>Truncilla truncata</i>	33.15	21.60	28.45
AM	6/24/92	<i>Truncilla truncata</i>	34.60	23.30	30.50
AM	6/24/92	<i>Truncilla truncata</i>	31.55	19.15	25.95
AM	6/24/92	<i>Truncilla truncata</i>	37.00	21.70	32.60
AM	6/24/92	<i>Truncilla truncata</i>	20.10	11.80	16.20
AM	6/24/92	<i>Truncilla truncata</i>	33.65	22.40	29.20
AM	6/24/92	<i>Truncilla truncata</i>	34.05	20.25	28.15
AM	6/24/92	<i>Truncilla truncata</i>	33.15	27.20	20.25
AM	6/24/92	<i>Truncilla truncata</i>	22.80	13.25	19.45
AM	6/24/92	<i>Truncilla truncata</i>	26.70	15.50	22.10
AM	6/24/92	<i>Truncilla truncata</i>	22.05	12.70	17.35
AM	6/24/92	<i>Truncilla truncata</i>	25.85	16.85	22.10
AM	6/24/92	<i>Truncilla truncata</i>	30.85	11.75	24.45
AM	6/24/92	<i>Truncilla truncata</i>	23.75	12.55	13.00
AM	6/24/92	<i>Truncilla truncata</i>	24.10	14.80	20.10
AM	6/24/92	<i>Truncilla truncata</i>	19.95	12.10	16.40
AM	6/24/92	<i>Truncilla truncata</i>	14.65	7.10	10.45
AM	6/24/92	<i>Truncilla truncata</i>	26.00	13.40	20.85
AM	6/24/92	<i>Truncilla truncata</i>	21.10	11.65	16.35
AM	6/24/92	<i>Truncilla truncata</i>	26.40	15.65	21.35
AM	6/24/92	<i>Truncilla truncata</i>	23.25	13.30	18.40
AM	6/24/92	<i>Truncilla truncata</i>	20.90	12.00	12.80
AM	6/24/92	<i>Truncilla truncata</i>	22.15	11.85	16.95
AM	6/24/92	<i>Truncilla truncata</i>	24.15	12.25	17.60
AM	6/24/92	<i>Truncilla truncata</i>	13.55	7.60	9.80
AM	6/24/92	<i>Truncilla truncata</i>	10.10	3.90	6.85
AM	6/24/92	<i>Truncilla truncata</i>	5.60	2.50	3.40
AM	6/24/92	<i>Truncilla truncata</i>	7.25	2.70	4.55
AM	6/24/92	<i>Truncilla truncata</i>	38.40	23.40	32.20
AM	6/24/92	<i>Truncilla truncata</i>	31.60	12.90	25.80
AM	6/24/92	<i>Truncilla truncata</i>	37.25	22.20	30.65
AM	6/24/92	<i>Truncilla truncata</i>	43.25	26.85	34.85
AM	6/24/92	<i>Truncilla truncata</i>	54.75	41.10	46.05
AM	6/24/92	<i>Truncilla truncata</i>	27.05	11.40	23.05
AM	6/24/92	<i>Truncilla truncata</i>	55.10	36.00	43.80
AM	6/24/92	<i>Truncilla truncata</i>	34.60	27.50	28.65
AM	6/24/92	<i>Truncilla truncata</i>	21.45	11.80	17.15
AM	6/24/92	<i>Truncilla truncata</i>	25.35	15.35	20.45
AM	6/24/92	<i>Truncilla truncata</i>	28.50	17.15	29.20
AM	6/24/92	<i>Truncilla truncata</i>	22.55	14.05	18.55
AM	6/24/92	<i>Truncilla truncata</i>	29.50	28.35	25.30
AM	6/24/92	<i>Truncilla truncata</i>	24.90	13.25	19.30
AM	6/24/92	<i>Truncilla truncata</i>	55.95	32.70	45.75
AM	6/24/92	<i>Truncilla truncata</i>	46.00	28.10	40.00
AM	6/24/92	<i>Truncilla truncata</i>	40.75	25.22	34.35
AM	6/24/92	<i>Truncilla truncata</i>	44.35	29.95	39.65
AM	6/24/92	<i>Truncilla truncata</i>	39.15	18.40	26.05
AM	6/24/92	<i>Truncilla truncata</i>	26.50	14.50	22.50
AM	6/24/92	<i>Truncilla truncata</i>	32.50	19.25	26.00
AM	6/24/92	<i>Truncilla truncata</i>	16.60	8.35	13.45
AM	6/24/92	<i>Truncilla truncata</i>	22.25	12.80	18.00

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
AM	6/24/92	<i>Truncilla truncata</i>	18.70	10.95	14.00
AM	6/24/92	<i>Truncilla truncata</i>	22.70	12.25	17.70
AM	6/24/92	<i>Truncilla truncata</i>	33.00	16.40	24.90
AM	6/24/92	<i>Truncilla truncata</i>	31.70	13.25	26.10
AM	6/24/92	<i>Truncilla truncata</i>	26.60	15.65	20.75
AM	6/24/92	<i>Truncilla truncata</i>	16.45	9.15	14.15
AM	6/24/92	<i>Truncilla truncata</i>	14.55	7.00	9.90
AM	6/24/92	<i>Truncilla truncata</i>	12.40	6.65	9.60
AM	6/24/92	<i>Truncilla truncata</i>	12.90	6.65	8.55
AM	6/24/92	<i>Truncilla truncata</i>	14.30	7.85	10.80
AM	6/24/92	<i>Truncilla truncata</i>	6.30	2.65	4.15
AM	6/24/92	<i>Truncilla truncata</i>	21.40	12.10	17.50
AM	6/24/92	<i>Truncilla truncata</i>	20.90	10.50	15.45
AM	6/24/92	<i>Truncilla truncata</i>	19.65	11.40	16.60
AM	6/24/92	<i>Truncilla truncata</i>	6.50	2.65	4.30
AM	6/24/92	<i>Truncilla truncata</i>	6.45	2.35	3.75
AM	6/24/92	<i>Truncilla truncata</i>	15.75	7.50	11.20
AM	6/24/92	<i>Truncilla truncata</i>	49.50	30.10	39.65
AM	6/24/92	<i>Truncilla truncata</i>	39.65	25.95	34.50
AM	6/24/92	<i>Truncilla truncata</i>	48.40	33.45	44.85
AM	6/24/92	<i>Truncilla truncata</i>	40.40	23.75	33.10
AM	6/24/92	<i>Truncilla truncata</i>	39.30	21.55	33.00
AM	6/24/92	<i>Truncilla truncata</i>	40.95	25.15	33.15
AM	6/24/92	<i>Truncilla truncata</i>	21.70	13.35	17.40
AM	6/24/92	<i>Truncilla truncata</i>	41.85	22.50	33.40
AM	6/24/92	<i>Truncilla truncata</i>	32.55	13.20	26.00
AM	6/24/92	<i>Truncilla truncata</i>	24.55	13.50	19.25
AM	6/24/92	<i>Truncilla truncata</i>	29.00	16.65	22.65
AM	6/24/92	<i>Truncilla truncata</i>	26.15	15.50	22.85
AM	6/24/92	<i>Truncilla truncata</i>	21.40	12.45	17.20
AM	6/24/92	<i>Truncilla truncata</i>	32.25	13.25	26.85
AM	6/24/92	<i>Truncilla truncata</i>	26.10	16.15	21.20
AM	6/24/92	<i>Truncilla truncata</i>	21.95	12.10	17.45
AM	6/24/92	<i>Truncilla truncata</i>	31.70	19.55	27.10
AM	6/24/92	<i>Truncilla truncata</i>	24.10	15.35	20.55
AM	6/24/92	<i>Truncilla truncata</i>	48.50	28.45	34.60
AM	6/24/92	<i>Truncilla truncata</i>	38.65	26.45	35.15
AM	6/24/92	<i>Truncilla truncata</i>	32.40	19.60	27.45
AM	6/24/92	<i>Truncilla truncata</i>	20.40	12.15	16.50
AM	6/24/92	<i>Truncilla truncata</i>	24.40	13.05	19.25
AM	6/24/92	<i>Truncilla truncata</i>	22.65	12.05	17.70
AM	6/24/92	<i>Truncilla truncata</i>	22.55	11.90	17.00
AM	6/24/92	<i>Truncilla truncata</i>	20.05	11.30	15.30
AM	6/24/92	<i>Truncilla truncata</i>	23.30	12.50	18.40
AM	6/24/92	<i>Truncilla truncata</i>	21.40	11.70	16.40
AM	6/24/92	<i>Truncilla truncata</i>	14.30	6.80	10.20
AM	6/24/92	<i>Truncilla truncata</i>	14.80	7.70	11.00
AM	6/24/92	<i>Truncilla truncata</i>	7.00	2.65	4.30
AM	6/24/92	<i>Truncilla truncata</i>	6.55	2.55	4.20
AM	6/24/92	<i>Truncilla truncata</i>	55.20	32.00	47.10
AM	6/24/92	<i>Truncilla truncata</i>	28.95	12.15	24.50
AM	6/24/92	<i>Truncilla truncata</i>	46.35	25.60	38.60
AM	6/24/92	<i>Truncilla truncata</i>	26.95	15.35	21.50

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
AM	6/24/92	<i>Truncilla truncata</i>	39.95	25.80	34.15
AM	6/24/92	<i>Truncilla truncata</i>	23.60	13.20	19.55
AM	6/24/92	<i>Truncilla truncata</i>	29.70	17.90	26.60
AM	6/24/92	<i>Truncilla truncata</i>	26.05	13.50	20.60
AM	6/24/92	<i>Truncilla truncata</i>	24.55	16.10	20.90
AM	6/24/92	<i>Truncilla truncata</i>	20.85	11.85	16.00
AM	6/24/92	<i>Truncilla truncata</i>	22.50	12.35	17.15
AM	6/24/92	<i>Truncilla truncata</i>	21.75	11.85	17.35
AM	6/24/92	<i>Truncilla truncata</i>	13.00	6.74	9.35
AM	6/24/92	<i>Truncilla truncata</i>	21.90	11.65	15.70
AM	6/24/92	<i>Truncilla truncata</i>	21.15	13.35	16.95
AM	6/24/92	<i>Truncilla truncata</i>	49.10	32.70	43.75
AM	6/24/92	<i>Truncilla truncata</i>	37.15	21.85	32.45
AM	6/24/92	<i>Truncilla truncata</i>	48.20	29.60	42.75
AM	6/24/92	<i>Truncilla truncata</i>	37.40	22.00	30.20
AM	6/24/92	<i>Truncilla truncata</i>	38.70	30.00	37.80
AM	6/24/92	<i>Truncilla truncata</i>	23.25	12.50	18.20
AM	6/24/92	<i>Truncilla truncata</i>	4.60	2.25	3.25
AM	6/24/92	<i>Truncilla truncata</i>	28.85	16.25	23.05
AM	6/24/92	<i>Truncilla truncata</i>	51.70	41.50	42.45
AM	6/24/92	<i>Truncilla truncata</i>	35.10	20.75	30.20
AM	6/24/92	<i>Truncilla truncata</i>	40.75	22.40	33.95
DE	6/25/92	<i>Truncilla truncata</i>	40.00	24.70	33.35
DE	6/25/92	<i>Truncilla truncata</i>	28.30	11.25	24.90
DE	6/25/92	<i>Truncilla truncata</i>	38.20	22.60	32.35
DE	6/25/92	<i>Truncilla truncata</i>	17.00	10.20	13.95
DE	6/25/92	<i>Truncilla truncata</i>	21.50	11.75	16.50
DE	6/25/92	<i>Truncilla truncata</i>	19.80	10.25	15.45
DE	6/25/92	<i>Truncilla truncata</i>	48.50	28.60	40.30
DE	6/25/92	<i>Truncilla truncata</i>	22.45	12.75	18.15
DE	6/25/92	<i>Truncilla truncata</i>	21.90	11.45	16.55
DE	6/25/92	<i>Truncilla truncata</i>	21.30	11.20	17.30
DE	6/25/92	<i>Truncilla truncata</i>	23.65	13.15	18.30
DE	6/25/92	<i>Truncilla truncata</i>	46.45	24.45	35.75
DE	6/25/92	<i>Truncilla truncata</i>	41.30	25.40	33.50
DE	6/25/92	<i>Truncilla truncata</i>	40.65	23.95	32.75
DE	6/25/92	<i>Truncilla truncata</i>	55.45	32.80	44.05
DE	6/25/92	<i>Truncilla truncata</i>	40.40	26.95	36.35
DE	6/25/92	<i>Truncilla truncata</i>	32.85	18.30	25.90
DE	6/25/92	<i>Truncilla truncata</i>	36.65	21.65	29.80
DE	6/25/92	<i>Truncilla truncata</i>	27.30	16.90	24.60
DE	6/25/92	<i>Truncilla truncata</i>	27.15	15.60	22.45
DE	6/25/92	<i>Truncilla truncata</i>	50.95	28.05	39.90
DE	6/25/92	<i>Truncilla truncata</i>	14.20	8.20	11.60
DE	6/25/92	<i>Truncilla truncata</i>	14.40	8.75	12.00
DE	6/25/92	<i>Truncilla truncata</i>	15.60	7.70	10.90
DE	6/25/92	<i>Truncilla truncata</i>	6.65	2.85	4.40
DE	6/25/92	<i>Truncilla truncata</i>	41.50	28.60	38.65
DE	6/25/92	<i>Truncilla truncata</i>	22.60	13.60	18.95
DE	6/25/92	<i>Truncilla truncata</i>	45.40	27.55	40.45
DE	6/25/92	<i>Truncilla truncata</i>	51.50	34.55	43.65
DE	6/25/92	<i>Truncilla truncata</i>	32.05	17.60	25.90
DE	6/25/92	<i>Truncilla truncata</i>	30.55	18.75	26.30

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
DE	6/25/92	<i>Truncilla truncata</i>	30.55	18.90	25.25
DE	6/25/92	<i>Truncilla truncata</i>	21.85	11.50	16.55
DE	6/25/92	<i>Truncilla truncata</i>	8.05	3.40	5.10
DE	6/25/92	<i>Truncilla truncata</i>	7.40	3.40	4.70
DE	6/25/92	<i>Truncilla truncata</i>	6.60	2.80	4.55
DE	6/25/92	<i>Truncilla truncata</i>	27.45	16.35	24.35
DE	6/25/92	<i>Truncilla truncata</i>	18.95	10.40	14.10
DE	6/25/92	<i>Truncilla truncata</i>	7.00	2.65	4.55
DE	6/25/92	<i>Truncilla truncata</i>	22.90	12.70	17.20
DE	6/25/92	<i>Truncilla truncata</i>	21.00	11.60	16.05
DE	6/25/92	<i>Truncilla truncata</i>	40.60	24.10	34.50
DE	6/25/92	<i>Truncilla truncata</i>	16.65	8.40	12.25
DE	6/25/92	<i>Truncilla truncata</i>	59.85	34.10	49.75
DE	6/25/92	<i>Truncilla truncata</i>	50.25	29.55	39.40
DE	6/25/92	<i>Truncilla truncata</i>	33.15	21.15	28.50
DE	6/25/92	<i>Truncilla truncata</i>	18.70	10.70	14.00
DE	6/25/92	<i>Truncilla truncata</i>	29.65	16.10	24.25
DE	6/25/92	<i>Truncilla truncata</i>	20.85	12.55	16.55
DE	6/25/92	<i>Truncilla truncata</i>	42.70	28.40	37.90
DE	6/25/92	<i>Truncilla truncata</i>	22.95	12.75	17.95
DE	6/25/92	<i>Truncilla truncata</i>	19.40	11.55	16.05
DE	6/25/92	<i>Truncilla truncata</i>	25.25	14.40	20.80
DE	6/25/92	<i>Truncilla truncata</i>	33.65	18.70	26.95
DE	6/25/92	<i>Truncilla truncata</i>	31.10	16.50	24.65
DE	6/25/92	<i>Truncilla truncata</i>	19.70	11.75	15.70
DE	6/25/92	<i>Truncilla truncata</i>	25.65	15.05	21.35
DE	6/25/92	<i>Truncilla truncata</i>	22.75	14.25	16.70
DE	6/25/92	<i>Truncilla truncata</i>	21.45	12.70	17.10
DE	6/25/92	<i>Truncilla truncata</i>	20.25	9.80	15.75
DE	6/25/92	<i>Truncilla truncata</i>	18.50	11.40	14.20
DE	6/25/92	<i>Truncilla truncata</i>	35.05	19.75	29.00
DE	6/25/92	<i>Truncilla truncata</i>	22.65	11.65	18.15
DE	6/25/92	<i>Truncilla truncata</i>	25.00	14.85	20.15
DE	6/25/92	<i>Truncilla truncata</i>	19.00	10.55	15.20
DE	6/25/92	<i>Truncilla truncata</i>	34.70	20.90	29.55
DE	6/25/92	<i>Truncilla truncata</i>	24.50	13.35	19.15
DE	6/25/92	<i>Truncilla truncata</i>	23.10	12.25	17.00
DE	6/25/92	<i>Truncilla truncata</i>	51.60	31.50	42.60
DE	6/25/92	<i>Truncilla truncata</i>	25.50	16.20	23.15
DE	6/25/92	<i>Truncilla truncata</i>	16.05	8.35	11.10
DE	6/25/92	<i>Truncilla truncata</i>	37.55	20.55	30.10
DE	6/25/92	<i>Truncilla truncata</i>	22.80	11.70	17.15
EE	6/25/92	<i>Truncilla truncata</i>	40.60	23.00	33.15
EE	6/25/92	<i>Truncilla truncata</i>	43.00	22.90	32.90
EE	6/25/92	<i>Truncilla truncata</i>	48.60	29.40	40.25
EE	6/25/92	<i>Truncilla truncata</i>	42.25	29.65	39.25
EE	6/25/92	<i>Truncilla truncata</i>	34.40	22.25	28.20
EE	6/25/92	<i>Truncilla truncata</i>	34.60	19.50	29.75
EE	6/25/92	<i>Truncilla truncata</i>	24.45	14.80	20.45
EE	6/25/92	<i>Truncilla truncata</i>	31.50	18.10	25.85
EE	6/25/92	<i>Truncilla truncata</i>	16.95	9.80	13.25
EE	6/25/92	<i>Truncilla truncata</i>	40.40	22.55	34.05
EE	6/25/92	<i>Truncilla truncata</i>	17.40	9.65	12.70

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
EE	6/25/92	<i>Truncilla truncata</i>	22.60	12.30	17.20
EE	6/25/92	<i>Truncilla truncata</i>	34.75	21.50	29.40
EE	6/25/92	<i>Truncilla truncata</i>	14.85	7.65	10.55
EE	6/25/92	<i>Truncilla truncata</i>	27.20	11.55	22.25
EE	6/25/92	<i>Truncilla truncata</i>	14.60	7.20	10.80
EE	6/25/92	<i>Truncilla truncata</i>	14.15	8.00	10.45
EE	6/25/92	<i>Truncilla truncata</i>	38.10	24.65	35.90
EE	6/25/92	<i>Truncilla truncata</i>	20.80	11.20	15.70
EE	6/25/92	<i>Truncilla truncata</i>	34.65	20.20	29.35
EE	6/25/92	<i>Truncilla truncata</i>	16.45	10.50	19.95
EE	6/25/92	<i>Truncilla truncata</i>	58.65	38.20	46.75
EE	6/25/92	<i>Truncilla truncata</i>	27.45	17.70	22.95
EE	6/25/92	<i>Truncilla truncata</i>	30.85	18.45	26.00
EE	6/25/92	<i>Truncilla truncata</i>	14.60	8.00	10.70
EE	6/25/92	<i>Truncilla truncata</i>	19.50	11.80	15.35
EE	6/25/92	<i>Truncilla truncata</i>	23.30	13.05	19.35
EE	6/25/92	<i>Truncilla truncata</i>	32.90	17.75	25.90
EE	6/25/92	<i>Truncilla truncata</i>	20.25	12.35	16.30
EE	6/25/92	<i>Truncilla truncata</i>	12.85	6.05	9.70
EE	6/25/92	<i>Truncilla truncata</i>	37.10	19.55	27.90
EE	6/25/92	<i>Truncilla truncata</i>	12.85	6.05	9.70
EE	6/25/92	<i>Truncilla truncata</i>	35.65	18.50	28.30
EE	6/25/92	<i>Truncilla truncata</i>	19.90	10.80	16.05
EE	6/25/92	<i>Truncilla truncata</i>	22.30	10.75	16.70
EE	6/25/92	<i>Truncilla truncata</i>	14.15	7.20	9.75
EE	6/25/92	<i>Truncilla truncata</i>	55.90	34.30	44.90
EE	6/25/92	<i>Truncilla truncata</i>	24.00	12.70	18.55
EE	6/25/92	<i>Truncilla truncata</i>	22.50	11.55	17.75
EE	6/25/92	<i>Truncilla truncata</i>	34.60	21.45	29.00
EE	6/25/92	<i>Truncilla truncata</i>	14.80	7.55	10.00
EE	6/25/92	<i>Truncilla truncata</i>	10.65	4.50	6.80
EE	6/25/92	<i>Truncilla truncata</i>	8.20	2.85	4.55
EE	6/25/92	<i>Truncilla truncata</i>	46.55	30.30	39.60
EE	6/25/92	<i>Truncilla truncata</i>	46.70	30.50	39.45
EE	6/25/92	<i>Truncilla truncata</i>	26.10	14.00	21.30
EE	6/25/92	<i>Truncilla truncata</i>	44.90	27.40	39.55
EE	6/25/92	<i>Truncilla truncata</i>	40.15	23.20	33.65
EE	6/25/92	<i>Truncilla truncata</i>	21.00	10.75	15.90
EE	6/25/92	<i>Truncilla truncata</i>	16.40	7.95	11.80
EE	6/25/92	<i>Truncilla truncata</i>	20.65	11.25	16.15
EE	6/25/92	<i>Truncilla truncata</i>	14.45	5.90	9.10
EE	6/25/92	<i>Truncilla truncata</i>	35.70	25.00	34.15
EE	6/25/92	<i>Truncilla truncata</i>	46.95	28.05	33.05
EE	6/25/92	<i>Truncilla truncata</i>	13.80	6.55	9.30
EE	6/25/92	<i>Truncilla truncata</i>	41.20	28.05	31.70
EE	6/25/92	<i>Truncilla truncata</i>	19.75	10.40	15.35
EE	6/25/92	<i>Truncilla truncata</i>	18.55	11.30	14.55
EE	6/25/92	<i>Truncilla truncata</i>	24.05	12.80	16.30
EE	6/25/92	<i>Truncilla truncata</i>	55.70	31.60	43.95
EE	6/25/92	<i>Truncilla truncata</i>	18.90	11.00	15.20
EE	6/25/92	<i>Truncilla truncata</i>	16.25	8.85	12.70
EE	6/25/92	<i>Truncilla truncata</i>	12.90	10.50	14.75
EE	6/25/92	<i>Truncilla truncata</i>	21.60	11.95	16.00

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
EE	6/25/92	<i>Truncilla truncata</i>	14.60	8.05	11.05
EE	6/25/92	<i>Truncilla truncata</i>	19.85	10.55	15.45
EE	6/25/92	<i>Truncilla truncata</i>	22.20	12.70	18.10
EE	6/25/92	<i>Truncilla truncata</i>	38.50	21.70	29.60
EE	6/25/92	<i>Truncilla truncata</i>	47.15	26.50	39.05
EE	6/25/92	<i>Truncilla truncata</i>	43.00	28.60	39.05
EE	6/25/92	<i>Truncilla truncata</i>	48.55	29.30	38.65
EE	6/25/92	<i>Truncilla truncata</i>	48.05	31.65	40.60
EE	6/25/92	<i>Truncilla truncata</i>	50.05	30.80	41.55
EE	6/25/92	<i>Truncilla truncata</i>	36.60	23.25	31.95
EE	6/25/92	<i>Truncilla truncata</i>	18.75	10.75	15.70
EE	6/25/92	<i>Truncilla truncata</i>	19.60	11.55	15.75
EE	6/25/92	<i>Truncilla truncata</i>	28.65	17.00	24.50
EE	6/25/92	<i>Truncilla truncata</i>	27.60	16.85	23.40
EE	6/25/92	<i>Truncilla truncata</i>	45.00	23.20	35.40
AW	7/1/92	<i>Truncilla truncata</i>	41.35	28.20	37.50
AW	7/1/92	<i>Truncilla truncata</i>	18.90	10.95	16.20
AW	7/1/92	<i>Truncilla truncata</i>	22.95	13.45	18.00
AW	7/1/92	<i>Truncilla truncata</i>	21.50	11.10	17.30
AW	7/1/92	<i>Truncilla truncata</i>	31.25	18.25	26.90
AW	7/1/92	<i>Truncilla truncata</i>	18.50	10.95	14.50
AW	7/1/92	<i>Truncilla truncata</i>	25.40	13.50	19.70
AW	7/1/92	<i>Truncilla truncata</i>	28.25	15.40	20.00
AW	7/1/92	<i>Truncilla truncata</i>	22.90	12.65	19.20
AW	7/1/92	<i>Truncilla truncata</i>	19.60	11.00	15.00
AW	7/1/92	<i>Truncilla truncata</i>	21.00	15.60	20.70
AW	7/1/92	<i>Truncilla truncata</i>	17.20	10.30	14.65
AW	7/1/92	<i>Truncilla truncata</i>	21.80	12.50	16.70
AW	7/1/92	<i>Truncilla truncata</i>	19.25	11.90	15.70
AW	7/1/92	<i>Truncilla truncata</i>	14.80	7.85	11.50
AW	7/1/92	<i>Truncilla truncata</i>	22.25	13.55	18.45
AW	7/1/92	<i>Truncilla truncata</i>	14.90	7.50	11.00
AW	7/1/92	<i>Truncilla truncata</i>	37.45	20.80	32.00
AW	7/1/92	<i>Truncilla truncata</i>	21.75	12.30	16.60
AW	7/1/92	<i>Truncilla truncata</i>	13.35	6.65	9.50
AW	7/1/92	<i>Truncilla truncata</i>	29.65	17.55	25.85
AW	7/1/92	<i>Truncilla truncata</i>	12.50	6.10	8.70
AW	7/1/92	<i>Truncilla truncata</i>	13.80	7.20	10.35
AW	7/1/92	<i>Truncilla truncata</i>	30.25	18.05	23.45
AW	7/1/92	<i>Truncilla truncata</i>	20.80	10.70	15.85
AW	7/1/92	<i>Truncilla truncata</i>	14.55	7.10	10.70
AW	7/1/92	<i>Truncilla truncata</i>	17.35	8.70	12.40
AW	7/1/92	<i>Truncilla truncata</i>	17.45	7.80	11.95
AW	7/1/92	<i>Truncilla truncata</i>	23.70	14.00	18.85
AW	7/1/92	<i>Truncilla truncata</i>	16.00	7.75	12.50
AW	7/1/92	<i>Truncilla truncata</i>	17.00	8.30	13.10
AW	7/1/92	<i>Truncilla truncata</i>	25.50	13.30	19.90
AW	7/1/92	<i>Truncilla truncata</i>	31.15	18.00	25.80
AW	7/1/92	<i>Truncilla truncata</i>	32.65	22.95	25.95
AW	7/1/92	<i>Truncilla truncata</i>	63.60	34.00	51.30
AW	7/1/92	<i>Truncilla truncata</i>	63.35	32.90	42.55
AW	7/1/92	<i>Truncilla truncata</i>	25.55	13.60	20.85
AW	7/1/92	<i>Truncilla truncata</i>	25.15	13.90	19.60

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
AW	7/1/92	<i>Truncilla truncata</i>	34.05	19.30	28.15
AW	7/1/92	<i>Truncilla truncata</i>	43.00	26.40	36.55
AW	7/1/92	<i>Truncilla truncata</i>	28.45	27.75	24.00
AW	7/1/92	<i>Truncilla truncata</i>	23.35	12.90	18.05
AW	7/1/92	<i>Truncilla truncata</i>	29.60	7.75	23.45
AW	7/1/92	<i>Truncilla truncata</i>	20.30	12.20	15.90
AW	7/1/92	<i>Truncilla truncata</i>	22.55	13.60	18.20
AW	7/1/92	<i>Truncilla truncata</i>	19.50	11.35	16.35
AW	7/1/92	<i>Truncilla truncata</i>	15.90	9.10	12.35
AW	7/1/92	<i>Truncilla truncata</i>	21.10	11.90	17.10
AW	7/1/92	<i>Truncilla truncata</i>	70.60	42.85	53.10
AW	7/1/92	<i>Truncilla truncata</i>	50.10	28.90	42.30
AW	7/1/92	<i>Truncilla truncata</i>	15.05	8.10	11.50
AW	7/1/92	<i>Truncilla truncata</i>	37.15	22.70	32.10
AW	7/1/92	<i>Truncilla truncata</i>	29.30	18.05	25.75
AW	7/1/92	<i>Truncilla truncata</i>	20.10	12.00	17.10
AW	7/1/92	<i>Truncilla truncata</i>	27.60	17.30	21.65
AW	7/1/92	<i>Truncilla truncata</i>	33.15	12.75	17.50
AW	7/1/92	<i>Truncilla truncata</i>	19.60	11.15	15.55
AW	7/1/92	<i>Truncilla truncata</i>	21.55	12.95	17.35
AW	7/1/92	<i>Truncilla truncata</i>	14.10	7.30	10.00
CE	6/30/92	<i>Truncilla truncata</i>	16.80	9.75	13.55
CE	6/30/92	<i>Truncilla truncata</i>	25.00	16.30	22.80
CE	6/30/92	<i>Truncilla truncata</i>	23.70	14.30	18.95
CE	6/30/92	<i>Truncilla truncata</i>	28.70	17.05	23.35
CE	6/30/92	<i>Truncilla truncata</i>	36.65	18.00	28.25
CE	6/30/92	<i>Truncilla truncata</i>	27.30	12.50	23.10
CE	6/30/92	<i>Truncilla truncata</i>	39.70	21.65	31.50
CE	6/30/92	<i>Truncilla truncata</i>	22.40	11.90	16.70
BE	6/30/92	<i>Truncilla truncata</i>	45.35	31.00	41.20
BE	6/30/92	<i>Truncilla truncata</i>	52.40	32.85	46.75
BE	6/30/92	<i>Truncilla truncata</i>	54.66	30.95	45.75
BE	6/30/92	<i>Truncilla truncata</i>	27.10	16.45	21.90
BE	6/30/92	<i>Truncilla truncata</i>	39.55	25.15	36.25
BE	6/30/92	<i>Truncilla truncata</i>	52.50	31.40	44.15
BE	6/30/92	<i>Truncilla truncata</i>	48.60	24.90	38.20
BE	6/30/92	<i>Truncilla truncata</i>	41.15	24.30	33.25
BE	6/30/92	<i>Truncilla truncata</i>	48.00	28.75	39.50
BE	6/30/92	<i>Truncilla truncata</i>	54.25	34.25	46.80
BE	6/30/92	<i>Truncilla truncata</i>	45.30	24.95	36.30
BE	6/30/92	<i>Truncilla truncata</i>	35.25	19.55	28.30
BE	6/30/92	<i>Truncilla truncata</i>	28.95	14.40	21.20
BE	6/30/92	<i>Truncilla truncata</i>	26.65	12.95	20.40
BE	6/30/92	<i>Truncilla truncata</i>	50.45	27.50	39.25
BE	6/30/92	<i>Truncilla truncata</i>	52.15	27.85	38.35
BE	6/30/92	<i>Truncilla truncata</i>	40.35	23.75	33.70
BE	6/30/92	<i>Truncilla truncata</i>	57.60	34.60	41.70
BE	6/30/92	<i>Truncilla truncata</i>	20.95	12.70	17.20
BE	6/30/92	<i>Truncilla truncata</i>	51.00	29.20	39.90
BE	6/30/92	<i>Truncilla truncata</i>	24.70	13.80	19.95
BE	6/30/92	<i>Truncilla truncata</i>	16.75	9.35	12.55
BE	6/30/92	<i>Truncilla truncata</i>	14.80	7.80	10.80
BE	6/30/92	<i>Truncilla truncata</i>	69.90	40.65	48.75

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
BE	6/30/92	<i>Truncilla truncata</i>	55.85	36.90	33.90
BE	6/30/92	<i>Truncilla truncata</i>	44.80	28.85	35.70
BE	6/30/92	<i>Truncilla truncata</i>	50.45	30.00	37.95
BE	6/30/92	<i>Truncilla truncata</i>	21.09	18.10	17.90
BE	6/30/92	<i>Truncilla truncata</i>	33.20	18.45	26.60
BE	6/30/92	<i>Truncilla truncata</i>	24.10	13.00	17.95
BE	6/30/92	<i>Truncilla truncata</i>	40.70	22.30	30.00
BE	6/30/92	<i>Truncilla truncata</i>	44.10	25.30	36.80
BE	6/30/92	<i>Truncilla truncata</i>	48.30	26.45	35.30
BE	6/30/92	<i>Truncilla truncata</i>	39.30	21.60	29.30
BE	6/30/92	<i>Truncilla truncata</i>	43.15	26.30	36.20
BE	6/30/92	<i>Truncilla truncata</i>	46.40	29.35	40.25
BE	6/30/92	<i>Truncilla truncata</i>	40.20	22.55	37.80
BE	6/30/92	<i>Truncilla truncata</i>	15.30	7.85	11.00
BE	6/30/92	<i>Truncilla truncata</i>	22.40	12.20	16.95
BE	6/30/92	<i>Truncilla truncata</i>	57.25	35.55	45.60
BE	6/30/92	<i>Truncilla truncata</i>	50.15	26.60	38.20
BE	6/30/92	<i>Truncilla truncata</i>	56.75	31.00	41.70
BE	6/30/92	<i>Truncilla truncata</i>	21.10	11.25	15.85
BE	6/30/92	<i>Truncilla truncata</i>	37.35	21.85	30.75
BE	6/30/92	<i>Truncilla truncata</i>	29.65	16.50	24.00
BE	6/30/92	<i>Truncilla truncata</i>	18.00	8.20	12.65
BE	6/30/92	<i>Truncilla truncata</i>	40.95	21.45	33.35
BE	6/30/92	<i>Truncilla truncata</i>	23.00	11.70	12.45
BE	6/30/92	<i>Truncilla truncata</i>	20.40	12.00	16.50
BE	6/30/92	<i>Truncilla truncata</i>	13.70	6.70	10.10
BE	6/30/92	<i>Truncilla truncata</i>	13.65	7.45	10.20
BE	6/30/92	<i>Truncilla truncata</i>	59.70	32.85	46.15
BE	6/30/92	<i>Truncilla truncata</i>	45.70	28.80	33.70
BE	6/30/92	<i>Truncilla truncata</i>	23.85	15.00	19.50
BE	6/30/92	<i>Truncilla truncata</i>	44.55	26.75	37.05
BE	6/30/92	<i>Truncilla truncata</i>	37.65	19.00	29.70
BE	6/30/92	<i>Truncilla truncata</i>	49.50	33.15	40.60
BE	6/30/92	<i>Truncilla truncata</i>	22.50	12.10	17.05
BE	6/30/92	<i>Truncilla truncata</i>	29.00	16.25	22.15
BE	6/30/92	<i>Truncilla truncata</i>	25.30	14.85	20.75
BE	6/30/92	<i>Truncilla truncata</i>	23.05	11.70	17.75
BE	6/30/92	<i>Truncilla truncata</i>	26.70	14.50	21.00
BE	6/30/92	<i>Truncilla truncata</i>	15.80	8.35	11.50
BE	6/30/92	<i>Truncilla truncata</i>	14.25	7.15	9.90
BE	6/30/92	<i>Truncilla truncata</i>	20.50	12.05	16.50
BE	6/30/92	<i>Truncilla truncata</i>	14.25	8.40	10.60
BE	6/30/92	<i>Truncilla truncata</i>	53.25	35.50	43.40
BE	6/30/92	<i>Truncilla truncata</i>	56.20	29.40	42.95
BE	6/30/92	<i>Truncilla truncata</i>	46.15	26.60	35.30
BE	6/30/92	<i>Truncilla truncata</i>	48.30	32.35	39.90
BE	6/30/92	<i>Truncilla truncata</i>	33.80	19.10	27.65
BE	6/30/92	<i>Truncilla truncata</i>	47.05	27.30	39.95
BE	6/30/92	<i>Truncilla truncata</i>	67.55	37.40	57.15
BE	6/30/92	<i>Truncilla truncata</i>	56.20	34.00	42.45
DM	6/4/92	<i>Tritigonia verrucosa</i>	78.30	26.10	49.66
CW	6/17/92	<i>Tritigonia verrucosa</i>	81.90	23.40	48.05
CW	6/17/92	<i>Tritigonia verrucosa</i>	85.85	27.75	54.00

Appendix 1 - List of species collected at Interstate Park

SITE	DATE	SPECIES	Shell Length (mm)	Shell Width (mm)	Shell Height (mm)
AM	6/24/92	<i>Tritigonia verrucosa</i>	96.45	34.70	57.50
AM	6/24/92	<i>Tritigonia verrucosa</i>	59.15	17.50	35.40
AW	7/1/92	<i>Tritigonia verrucosa</i>	81.20	24.50	50.00
AW	7/1/92	<i>Tritigonia verrucosa</i>	55.75	21.40	33.15
BE	6/30/92	<i>Tritigonia verrucosa</i>	40.05	9.35	19.00
BE	6/30/92	<i>Tritigonia verrucosa</i>	82.00	27.10	50.10
BE	6/30/92	<i>Tritigonia verrucosa</i>	86.90	30.55	55.80
BE	6/30/92	<i>Tritigonia verrucosa</i>	100.65	34.90	62.25
BE	6/30/92	<i>Tritigonia verrucosa</i>	103.50	34.30	66.60