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FEDERAL ENERGY
REGULATORY COMMISSION

Ms. Janet M. Smith
Field Supervisor
United States Department of the Interior
Green Bay Field Office
1015 Challenger Court
Green Bay, WI 54311-8331

November 1, 2000

Ms. Ann Whipp
Department of Natural Resources
473 Griffith Avenue
Wisconsin Rapids, WI 54494

Dear Ms. Smith and Ms. Whipp:

Subject: Nekoosa Papers Inc.
FERC Projects 2255, 2291, and 2292
Centralia, Port Edwards, and Nekoosa Projects
Purple Loosestrife Monitoring

Attached is a report for purple loosestrife monitoring as required by Article 408 for projects 2255 and 2291, and by Article 407 for project 2292. A single report for the three projects has been prepared.

The survey is required on an annual basis, but the reporting is due on a biennial basis. However, we have chosen to send the reports as they are received. The survey was performed substantially as described in the plan submitted to the FERC Secretary on January 13, 1997, and as approved by FERC on July 16, 1997. The 2000 survey was performed during August and early September.

The one exception of the actual survey to the plan was that NPI contracted Dr. Robert W. Freckmann from the University of Wisconsin-Stevens Point to conduct the survey as opposed to using trained NPI employees.

If there are any questions, please feel free to contact me at (715) 887-5253.

Sincerely,

David K. Reinke
Manager, Regulatory & Env. Compliance

DKR:kd

cc: Federal Energy Regulatory Commission, Chicago Regional Office, 230 South Dearborn Street, Room 3130, Chicago, IL 60604

Secretary, Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, DC 20426

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PURPLE LOOSESTRIFE MONITORING SURVEY FOR 2000

prepared September 27, 2000 for

Nekoosa Papers, Inc.,
a subsidiary of Georgia-Pacific Corporation

by

Flark Associates, Inc.
8221 100th Street South
Wisconsin Rapids, Wisconsin 54494

Principal Investigator: Robert W. Freckmann, Ph. D.
Professor of Biology and Curator of Vascular Plants
University of Wisconsin – Stevens Point

BACKGROUND:

During July and August, 1997, Flark Associates, Inc. conducted a survey for the occurrence of *Lythrum salicaria* L., purple loosestrife, within the project boundary lands as designated on the Nekoosa Papers, Inc. Project Boundary Location Drawings Numbers DC 305, DC 306, DC 307, DJ 2894, DJ 2740, and DN 2341. During that period the principal investigator covered on foot most of the west side of the Wisconsin River from Wisconsin Rapids through to the boundary area south of Nekoosa, as well as most of the east side of the Wisconsin River and the islands accessible by bridges. The smaller islands and outcroppings were surveyed by boat. The principal investigator made general notes on the vegetation and took black and white or color photographs at various locations to document either the general nature of the vegetation in areas free of purple loosestrife at that time, or to show representative areas of purple loosestrife infestations as of 1997. The locations of the purple loosestrife plants were marked on the Project Boundary Location Drawings and on a reduced photocopy of these drawings. The results of this survey were summarized in a report prepared on September 4, 1997 and submitted to Georgia-Pacific.

During July and August, 1998, the principal investigator conducted a survey for purple loosestrife within the same project boundary lands which were surveyed in 1997. One of the objectives of the 1998 survey was to duplicate the coverage of 1997 to eliminate variation due to methods so that the results would reflect actual changes in purple loosestrife distribution. The investigator carried copies of the drawings submitted with the previous report and marked 1998 purple loosestrife occurrences directly on these 1997 drawings. He also revisited sites where photographs were taken in 1997 and took new photographs for comparison. Any major changes in the vegetation at any site from

1997 to 1998 were noted. One addition was made in the 1998 survey. Several purple loosestrife populations were examined to determine whether the populations consisted of plants of all the same style length or of two or three style lengths, and to note indications of maturing seed. The only major part of the 1997 survey which was not repeated in 1998 was the survey by boat between the Nekoosa dam and the Port Edwards hydroelectric plant. This part of the Wisconsin River was surveyed by binoculars from shore in 1998.

In July and August 1999 the same principal investigator surveyed the same areas as those covered in 1997 and 1998, following the same survey procedures as used in 1998. Most of the photographs taken in 1999 show approximately the same areas as those in the 1997 and 1998 photographs. The maps included in the 1998 report were duplicated with symbols added to indicate either new purple loosestrife population discovered in the 1999 survey or the absence in 1999 of purple loosestrife populations present in 1998.

In August and early September 2000 the same principal investigator repeated the procedures of the 1998 and 1999 surveys. Photographs were again taken from many of the same places as those of previous years, often using certain large distinctive trees as markers to make the photographs as nearly comparable to previous years as possible. Field notes were taken as in previous years and some populations were checked again to see if there were plants of only one flower type (and therefore less likely to produce seed) or of two or all three flower types. Since the field work was done somewhat later this year than in 1999, fewer observations were made on flower types, but more observations were made on fruit set. The maps included in the 1999 report were again duplicated and the changes noted in 2000 were superimposed. As was done in 1999, areas which did not have purple loosestrife present previously were checked with binoculars and if there still was no evidence of purple loosestrife the survey on foot was reduced to spot checks.

DESCRIPTIONS OF THE PURPLE LOOSESTRIFE POPULATIONS IN 2000:

As noted in the 1997 report, much of the land shown on drawing DC-305 is residential and neither the neighborhood nor the vegetation appears to have changed during the past three years. Purple loosestrife plants had been uprooted at four locations on the west bank of the Wisconsin River during the 1997 survey. Two of these sites were free of purple loosestrife in 1998, but new plants were found at the other two sites. One well-established population in 1997 appeared to be unchanged in 1998 and three new populations were noted in 1998.

All of the new populations in 1998 consisted of only long-styled plants. The flowers of purple loosestrife are composed of 5, 6, or 7 erect clawed petals surrounded by the same number of sepals, and these combine to form a tube. Nectar is produced at the base of this tube. Most insects visiting the flowers probe head-downward for the nectar while their head, thorax, and abdomen typically contact anthers or stigmas. A purple loosestrife plant can have one of three arrangements of anthers and stigmas. A short-

styled plant has the stigma at a level which is apt to contact the head of a typical pollinator and pick up any pollen present on the insect's head. Half of the 10-14 anthers are on medium length filaments and tend to deposit pollen on the thorax of the insect; the other half of the anthers are on long filaments and tend to deposit pollen on the abdomen. A medium-styled plant has stigmas at a level where it tends to contact the thorax, and anthers on short and long filaments where they tend to deposit pollen on the head and abdomen. A long-styled plant can pick up pollen from the abdomen and deposit pollen on the head and thorax. Pollinators visiting flowers of the same style lengths tend to pick up pollen on the same parts of the body and transfer little to the stigmas. Therefore, isolated populations of plants with the same style length produce little seed; populations with two or three style lengths are apt to be the main sources of purple loosestrife seed. In 1998 only the population on the west bank opposite Pete Rogers' Island had two style lengths – long and medium.

Although no new populations were detected in the area covered by the DC-305 drawing in 1999, two plants with short-styled flowers were found. Because no short-styled plants were seen here in 1998, these may indicate that some new plants have come into these populations in the past year. Although plants of each of the three types were found in the survey in 2000, the total number of plants on the west side of the river north of the bridge is obviously reduced from previous years. Purple loosestrife has almost vanished near the point where First Avenue turns to the west. It appears that they have been shaded out by growth of river birch, *Betula nigra* L.; American elm, *Ulmus americana* L.; green ash, *Fraxinus pennsylvanica* Marshall; dogwoods, *Cornus* spp.; grapes, *Vitis riparia* Michaux; and especially black locust, *Robinia pseudoacacia* L.; and glossy-leaved buckthorn, *Rhamnus frangula* L.

Figures 1-8 and 11-12 in this report are matched pairs of photographs taken in 1997-99 and photographs taken in 2000. These photographs show little change in the vegetation and no evidence of notable purple loosestrife spread.

The area in drawing DC-306 included only two large populations of purple loosestrife in 1997, 1998, and 1999. The population on the west bank opposite Garrison Island includes plants of all three style lengths, but the population appears to be smaller than previous years, probably being crowded out and shaded by a mixture of shrubs; goldenrods, *Solidago canadensis* L. and *S. gigantea* Aiton; bluejoint grass, *Calamagrostis canadensis* (Michaux) P. Beauv.; etc. Figure 20 shows one example of shrub growth crowding out purple loosestrife. In 1997 a large floating clump of purple loosestrife had washed up against the bank at the boat landing and parking area on the west bank of the Wisconsin River at the mouth of Boles Creek. It was removed at that time along with some other plants on the west bank. As of 2000 no new plants have become established. A plant was noted and photographed on a small rock outcropping in the Wisconsin River near Edwards Island in 1997. It has been observed and photographed each year including 2000 (e.g. figures 13 & 14), but it remains a solitary plant. In 1998 a few plants were seen on the bank south of Boles Creek at the edge of the mowed lawn around the Masonic Lodge. No plants were seen here in 1999, but this year

either new plants have come in or possibly the 1998 plants had been mowed last year are now have recovered (figures 23 & 24 show this area in 1997 and 2000).

In all previous surveys a large population of purple loosestrife was present and photographed (e.g. figure 17 & 18) around the Centralia dam and footpath. No plants were noted or photographed along the crest of the dam above the footpath in the 2000 survey (figure 19). Another population associated with the Centralia dam includes mostly long-styled plants with some medium-styled individuals. This population seems to be unchanged over the four years of the survey.

In 1997 one plant was seen and removed from the east bank of the Wisconsin River at the mouth of a small stream and no plants were seen here in 1998. In 1999, two small purple loosestrife plants were noted and removed from the Wisconsin River bank slightly north of the 1997 site. However, several new plants were seen in 2000 along with a growing population of glossy-leaved buckthorn. Because the east bank of the Wisconsin River is still remarkably free of loosestrife and most other invasive aliens, this site should be watched carefully for signs of spread of both exotic species.

The hiking and biking trail area in DC-307 continues to be free of purple loosestrife (figures 21 & 22). Deep shade and dense native vegetation should continue to make establishment of purple loosestrife here unlikely.

In 1998 the purple loosestrife population on the headwaters dam in DJ-2894 was conspicuously reduced from 1997, but short and long-styled plants were common on soil amid concrete structures west of the dam. The populations noted in the 1997 survey on the west bank above the Port Edwards hydro-electric plant were also essentially unchanged in 1998. In 1999, with the river level down and construction work on the dam, the purple loosestrife populations of the previous two years were greatly reduced. The construction activity eliminated most of the vegetation, including all but a few small loosestrife plants. Purple loosestrife on the west bank above the Port Edwards hydro-electric plant was almost eliminated, possibly due to desiccation of the plants following the drop in water level. Only a few plants have returned in 2000. Another population of purple loosestrife on the west bank of the Wisconsin River where highway 54 turns west is now being crowded out by the spread of Amur silver-plume, *Miscanthus sacchariflorus* (Maxim.) Hackel, an ornamental grass which spreads vigorously by rhizomes. Because it is almost completely sterile, it depends on transplanting to move to a new location, and its presence is probably a welcome alternative to the loosestrife. The north end of this purple loosestrife population is also being crowded out by mixed shrub and herbaceous vegetation as shown in figures 25, 26, & 27, taken in 1997, 1998, and 2000.

As noted in the 1999 report, the total population of purple loosestrife in most of the area shown on DN-2740 does not appear to have shown any net change from 1997 through 1999, and no obvious change was seen in 2000. The plants are moderately common, but scattered. Removal of plants in 1997 and 1998 does not seem to have had any effect on the populations, probably because there are many small areas of open

disturbed ground on the banks, islands, and small rock outcropping where purple loosestrife can become established. However, the wetland between the bend of the river and state highway 73 has changed in the past two years from scattered purple loosestrife to dominance by that species. Previously this was a fairly disturbed area dominated by narrow-leaved cattail, *Typha angustifolia* L., with reed canary-grass, *Phalaris arundinacea* L., on the slope. This was the only area where loosestrife changed from scattered occurrence to dominance between 1998 and 1999. The population in 2000 seems to be about the same as that seen in 1999.

In 1998 the purple loosestrife density or distribution in the Nekoosa area indicated on drawing DN-2341 was essentially unchanged from 1997, except on the west bank of the river north of the highway 173 bridge. The 1999 report had noted that the loosestrife had almost vanished here, apparently as a result of the growth of black locust and sumac, *Rhus typhina* L., which have shaded it. The trend toward elimination of purple loosestrife by woody vegetation continues in 2000, as shown in figures 31 & 32. The draw down of the river in 1999 apparently eliminated some purple loosestrife plants by leaving them desiccated on the higher part of the bank, but allowing some new plants to colonize the area near the river at its lower stage. Now in 2000, with the water levels high again, the low-lying population have been flooded out, and in some place the purple loosestrife has been crowded out where the wooded vegetation extends to the water edge.

As noted in 1999, purple loosestrife appears to be increasing slowly down river from the Nekoosa dam as new plants appear on some of the small outcroppings in the river. Because these outcroppings are rather inaccessible and are open areas subject to colonization, this increase seems inevitable.

CONCLUSIONS

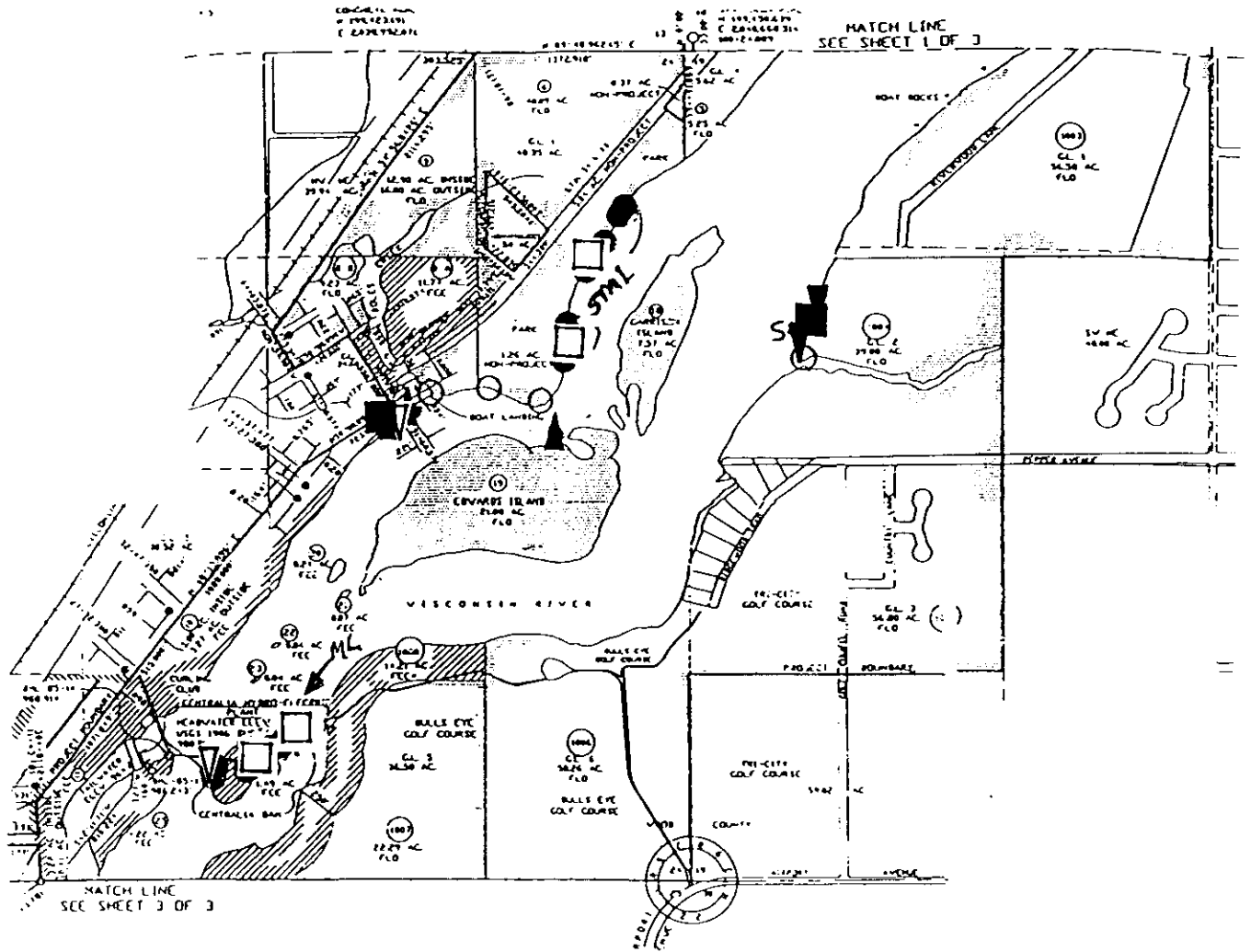
The opinion of the principal investigator remains the same as that expressed in the 1998 and 1999 reports: that purple loosestrife is not as abundant in the Wisconsin Rapids – Port Edwards – Nekoosa area as it is in most wetlands and along most rivers and roadsides in the more developed or ecologically disturbed areas in central Wisconsin.

In general, the net abundance of purple loosestrife appears to have remained about the same in 1998 as that noted in the 1997 survey, and if any change took place by August, 1999, it was that there is a slight reduction in the total number of plants. In 2000 there are few areas where the populations are larger than in 1999 and some places, such as near the Centralia Dam and in the Nekoosa area, where the reduction is remarkable. The survey of 2000 reinforces the statement made in the 1999 report that the most striking observation over the four years of this survey is how effective intact native vegetation and deep shade from trees and shrubs are in preventing purple loosestrife colonization, as shown by areas along the east bank of the Wisconsin River which are free from purple loosestrife. Control of purple loosestrife in these areas probably depends more on keeping these areas undisturbed and wooded, and in allowing native vegetation to grow more densely in other areas, than on efforts to pull or remove purple loosestrife. Repeating the comments of the 1999 report, it is probably fortunate that much of the

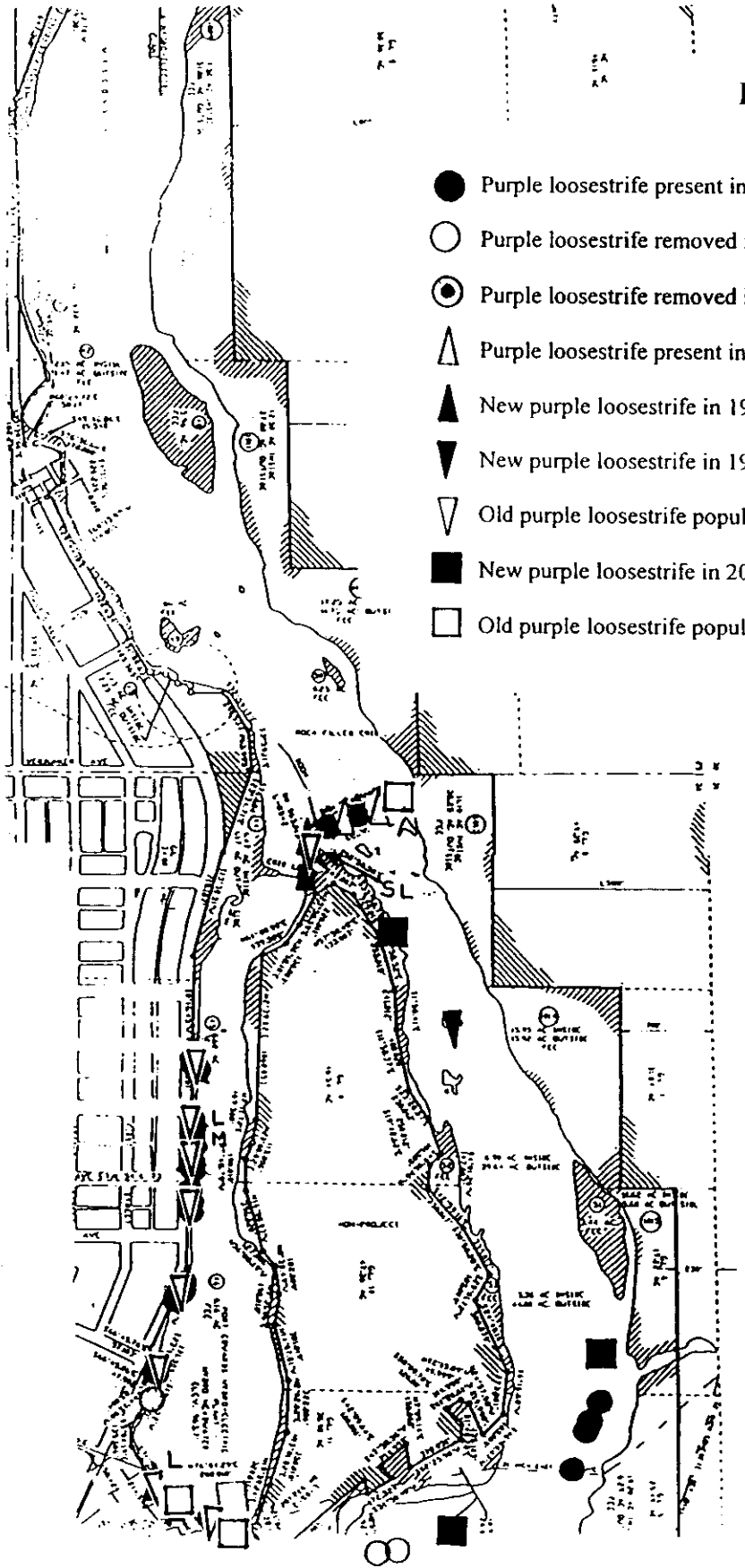
Wisconsin River bank in the Wisconsin Rapids – Port Edwards – Nekoosa area is owned by parks or relatively few private owners, making it easier to control disturbance of the river banks.

The main challenge is control of purple loosestrife on the small outcroppings in the Wisconsin River and in places on the dams where soil accumulates. At least at the time of observation in August this year the Centralia Dam was not serving as a source for germination of new loosestrife plants. But it could be exceedingly difficult to control establishment on the rock outcroppings in the river because these habitats are nearly inaccessible and are frequently disturbed by waves, currents, and fluctuations on water levels, thereby renewing the open, disturbed habitats conducive to purple loosestrife establishment.

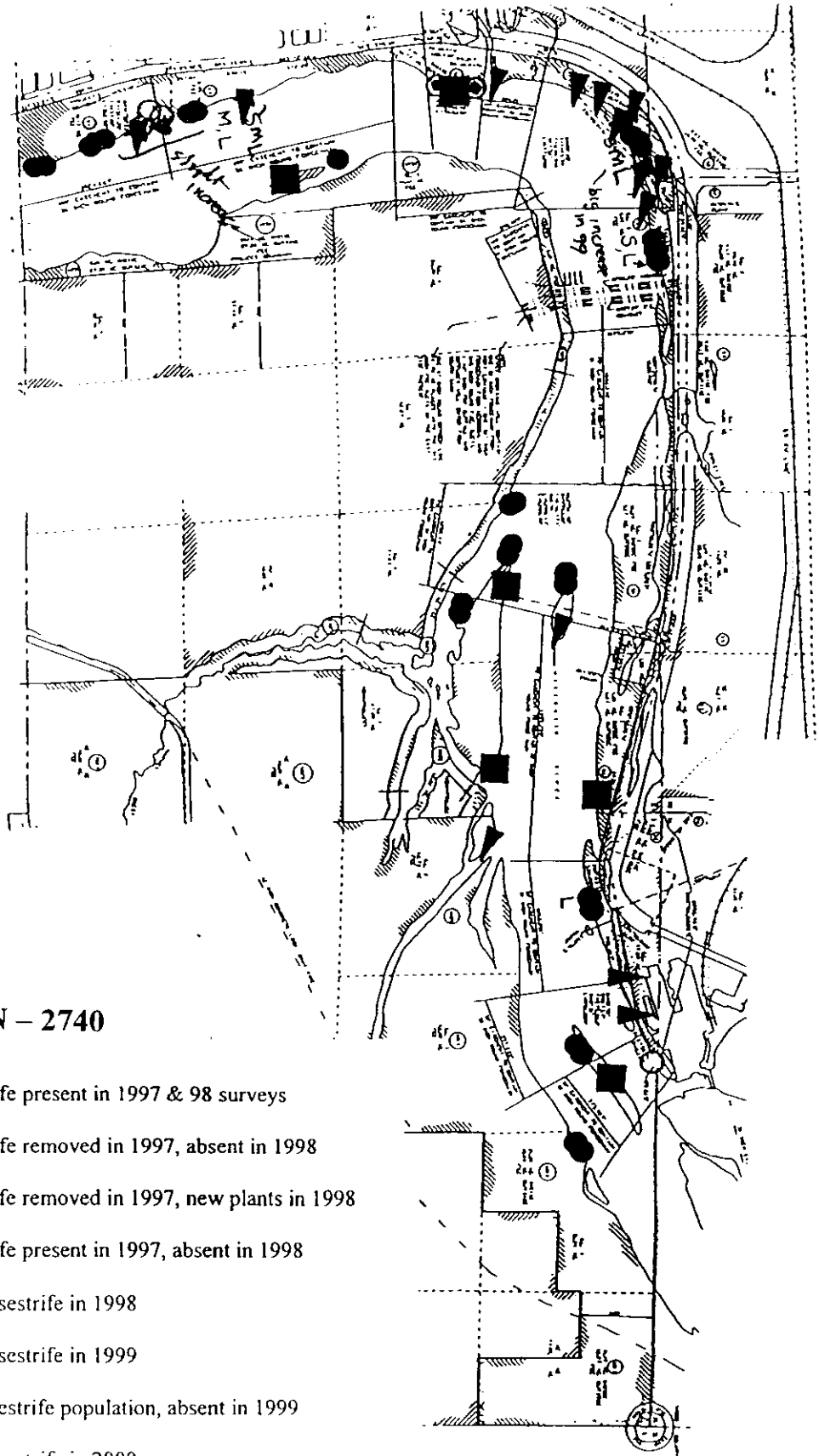
DRWG DC - 306



- Purple loosestrife present in 1997 & 98 surveys
- Purple loosestrife removed in 1997, absent in 1998
- ⊙ Purple loosestrife removed in 1997, new plants in 1998
- △ Purple loosestrife present in 1997, absent in 1998
- ▲ New purple loosestrife in 1998
- ▼ New purple loosestrife in 1999
- ▽ Old purple loosestrife population, absent in 1999
- New purple loosestrife in 2000
- Old purple loosestrife populations, absent in 2000



- Purple loosestrife present in 1997 & 98 surveys
- Purple loosestrife removed in 1997, absent in 1998
- ⊙ Purple loosestrife removed in 1997, new plants in 1998
- △ Purple loosestrife present in 1997, absent in 1998
- ▲ New purple loosestrife in 1998
- ▼ New purple loosestrife in 1999
- ▽ Old purple loosestrife population, absent in 1999
- New purple loosestrife in 2000
- Old purple loosestrife populations, absent in 2000



DRWG DN - 2740

- Purple loosestrife present in 1997 & 98 surveys
- Purple loosestrife removed in 1997, absent in 1998
- ⊙ Purple loosestrife removed in 1997, new plants in 1998
- △ Purple loosestrife present in 1997, absent in 1998
- ▲ New purple loosestrife in 1998
- ▼ New purple loosestrife in 1999
- ▽ Old purple loosestrife population, absent in 1999
- New purple loosestrife in 2000
- Old purple loosestrife populations, absent in 2000



Fig. 1. West side of Belle Island, 1998. No purple loosestrife.

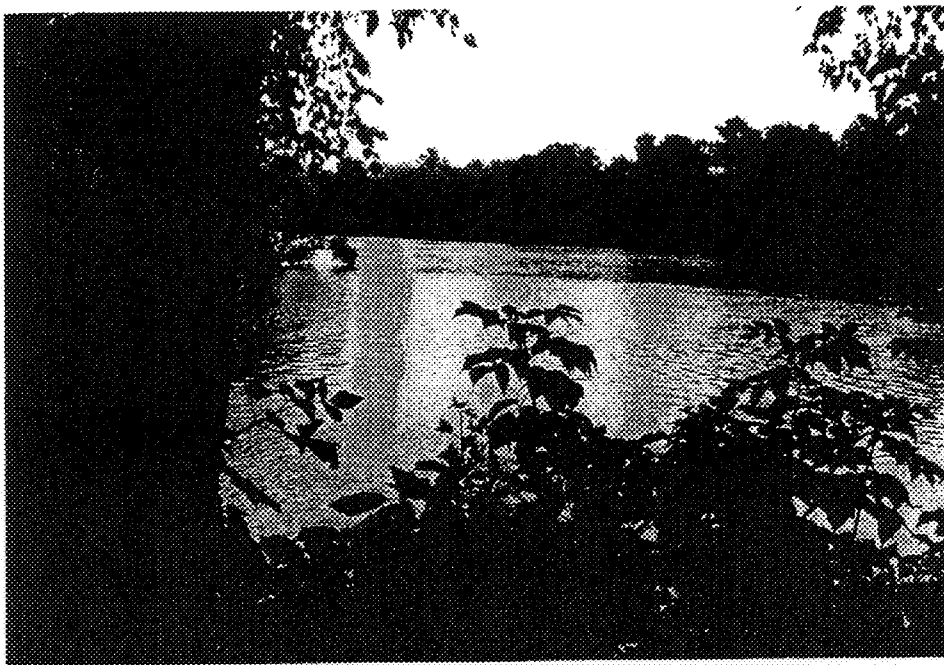


Fig. 2. West side of Belle Island, 2000. No purple loosestrife.



Fig. 3. West side of Pete Rogers Island, 1997. No purple loosestrife.

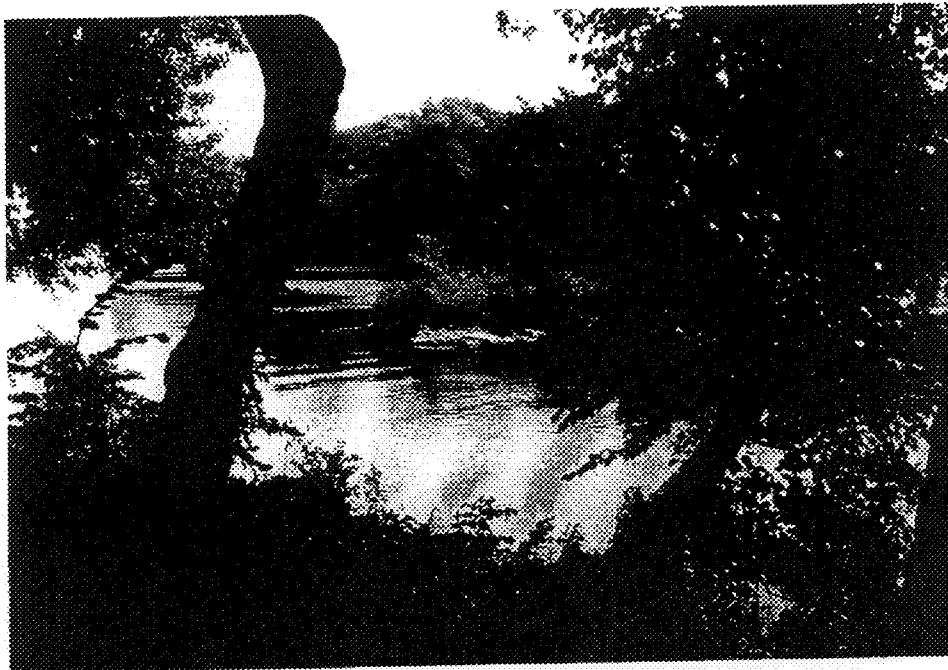


Fig. 4. West side of Pete Rogers Island, 2000. No purple loosestrife.



Fig. 5. West side of Witter Island, 1999. No purple loosestrife.



Fig. 6. West side of Witter Island, 2000. No purple loosestrife.



Fig. 7. West side of Witter Island, 1997. No purple loosestrife.



Fig. 8. West side of Witter Island, 2000. No purple loosestrife.

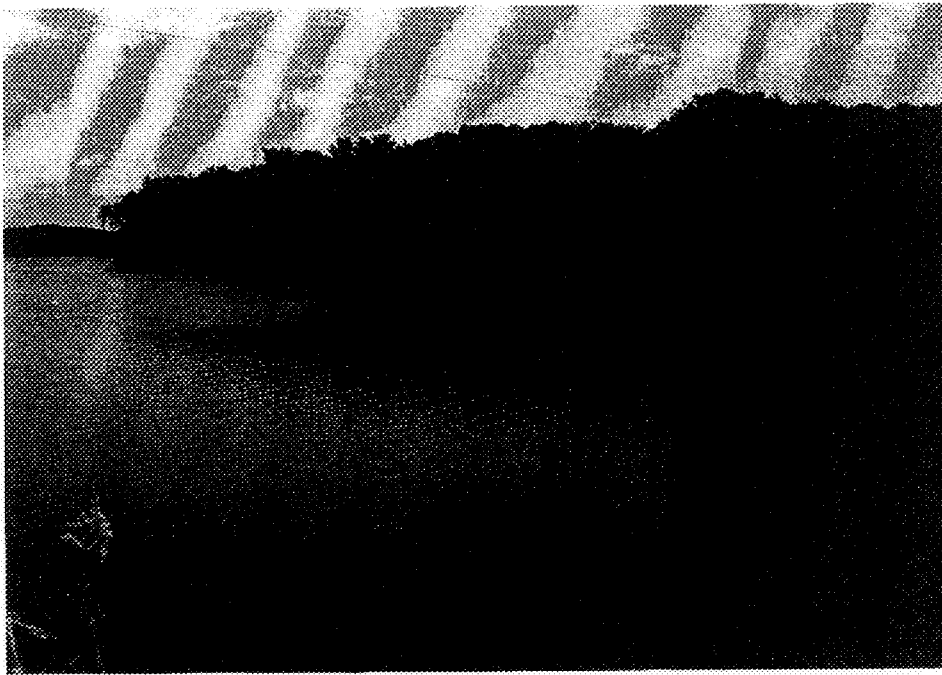


Fig. 9. North end of Garrison Island, 1998. No purple loosestrife.



Fig. 10. North end of Garrison Island, 2000. No purple loosestrife.



Fig. 11. West side of Witter Island, 1997. No purple loosestrife.



Figure 12. West side of Witter Island, 2000. No purple loosestrife.



Fig. 13. A small rock outcropping near Edwards Island, 1998. The purple loosestrife plants have appeared here since 1997.

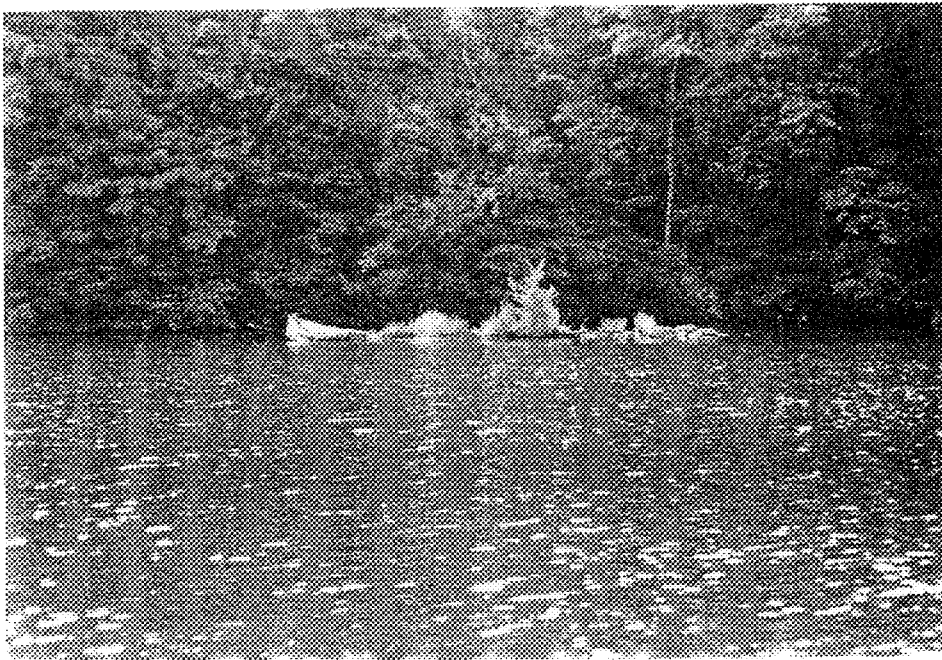


Fig. 14. The same small rock outcropping showing a slightly larger clump of purple loosestrife in 2000.

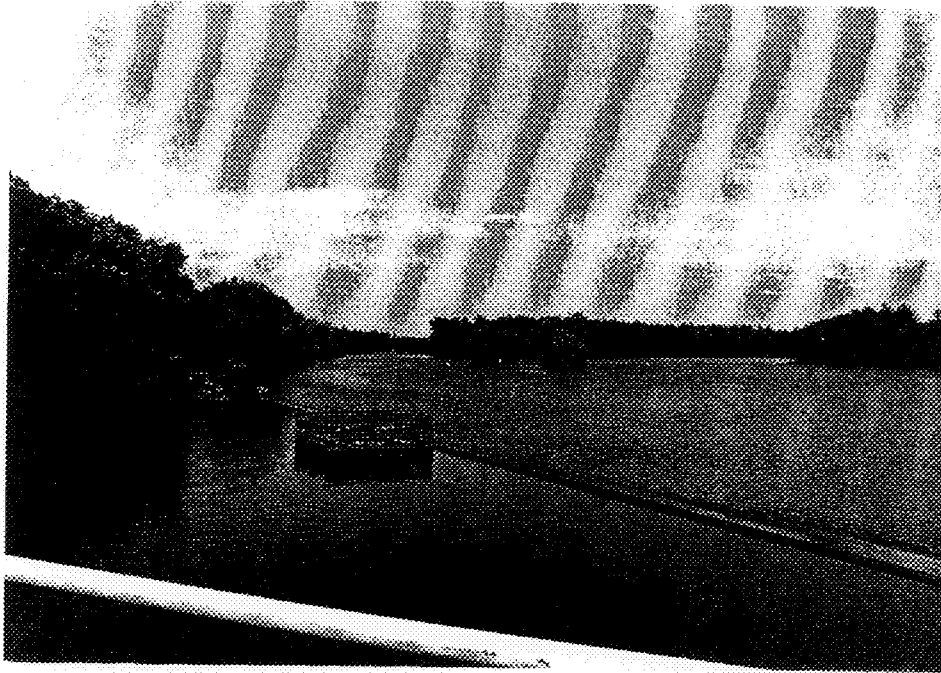


Fig. 15. The west bank of the Wisconsin River from the Centralia Dam, 1997. No purple loosestrife.



Fig. 16. The west bank of the Wisconsin River from the Centralia Dam, 2000. No purple loosestrife.

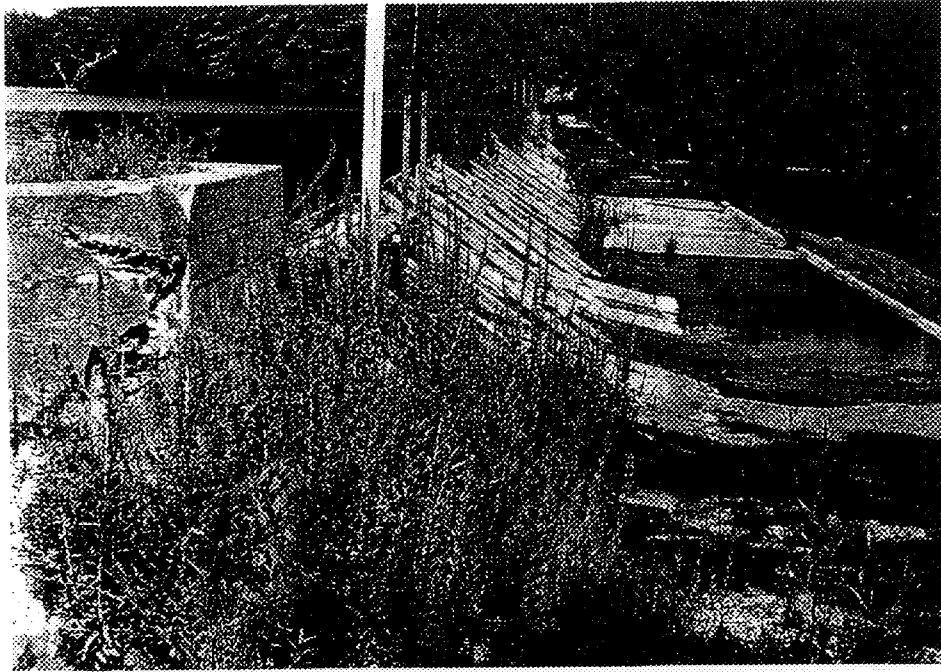


Fig. 17. Looking east across the Centralia Dam, 1997. Abundant purple loosestrife.

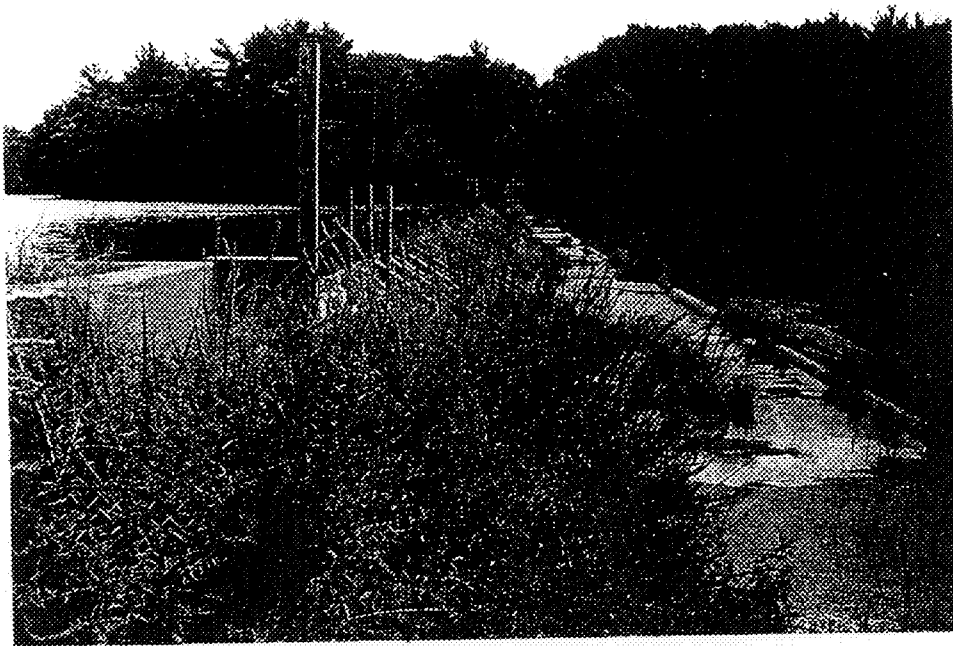


Fig. 18. Looking east across the Centralia Dam, 1998. Purple loosestrife less abundant on the dam.

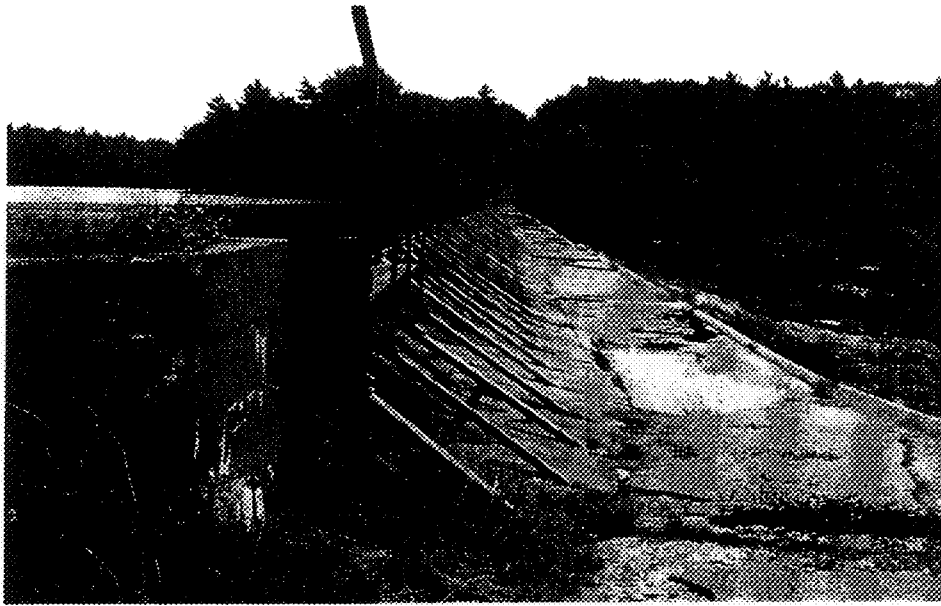


Fig. 19. Looking east across the Centralia dam in 2000. Purple loosestrife now absent from the crest of the dam.



Fig. 20. Shrub growth in 2000 crowding out purple loosestrife on west bank of the Wisconsin River south of the Department of Transportation offices.

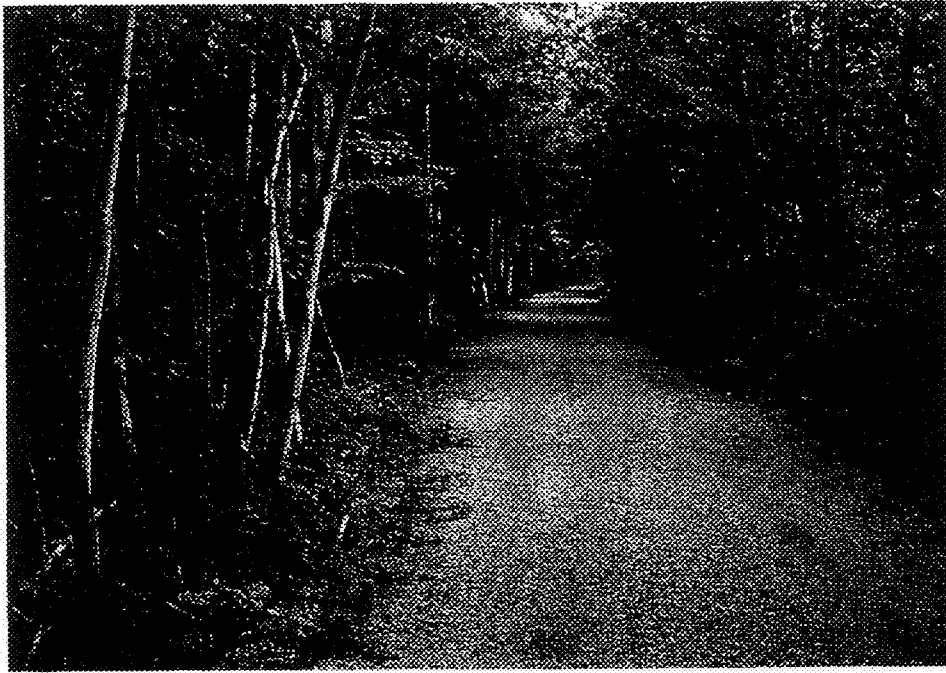


Fig. 21. Bicycle and hiking path, 1998. No purple loosestrife.

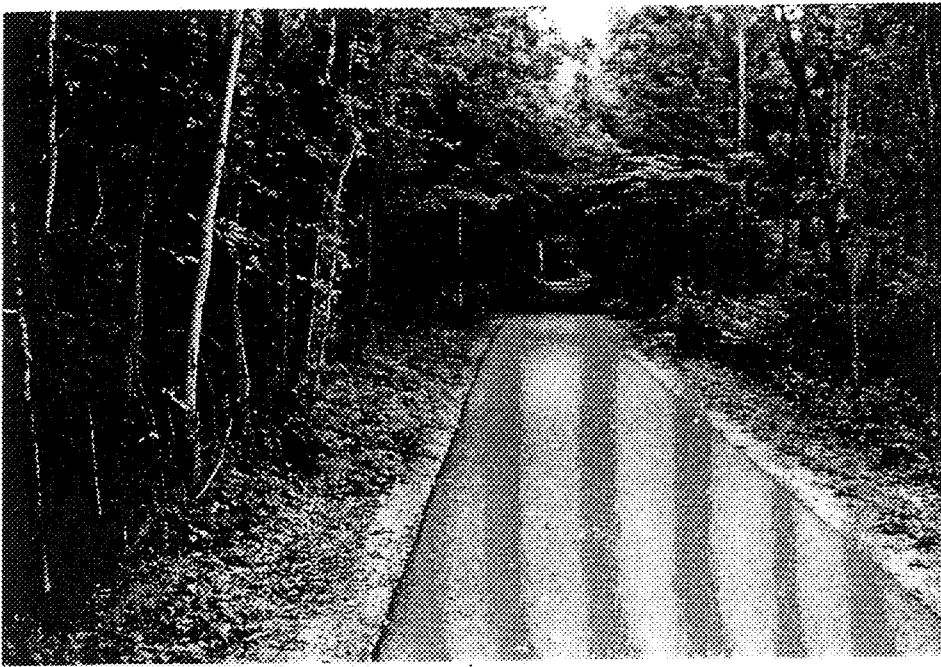


Fig. 22. Bicycle and hiking path, 2000. No purple loosestrife.

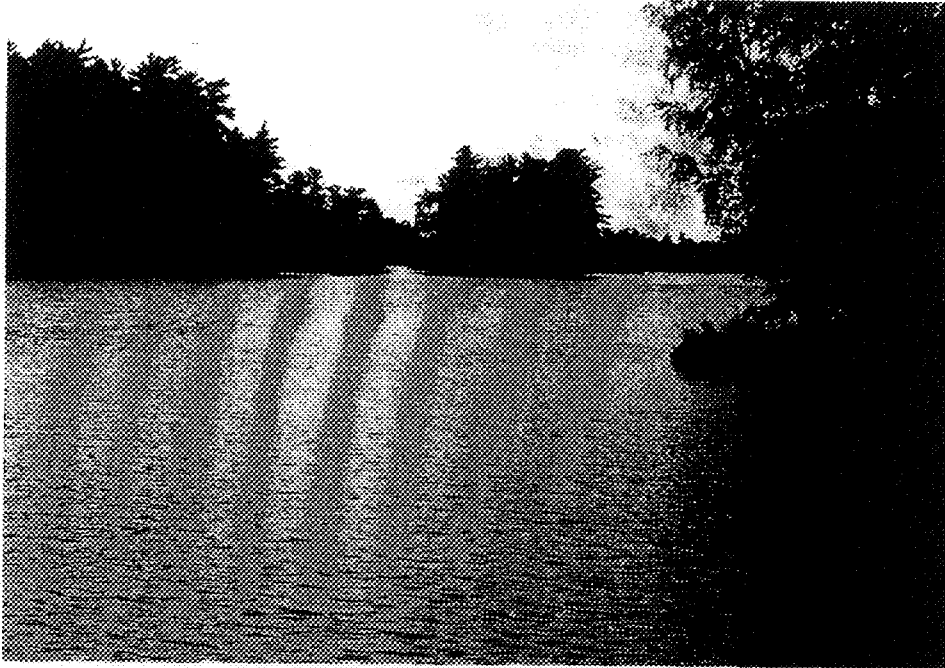


Fig. 23. Mouth of Boles Creek, 1997. No purple loosestrife.



Fig. 24. Mouth of Boles Creek, 2000. No purple loosestrife in photograph, but a few plants on the Masonic Lodge property to the right of the photo, appeared in 1998, were not seen in 1999, are present again in 2000.

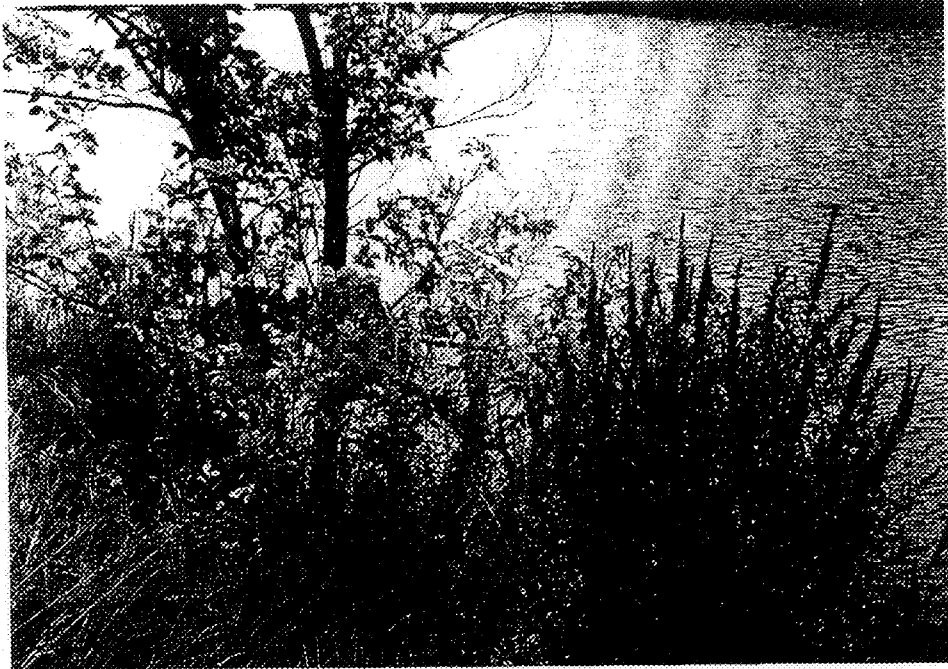


Fig. 25. Purple loosestrife on west bank of the Wisconsin River in Port Edwards near the point where highways 54 and 73 turn west away from the River, 1997.



Fig. 26. The same population of purple loosestrife in 1998, showing moderate growth.



Fig. 27. The same purple loosestrife population in 2000, showing plants which had come in during the 1999 low river level now being inundated by high water or crowded out by shrub growth.



Fig. 28. Port Edwards hydro plant looking toward the Georgia Pacific communications building in 1997. Purple loosestrife sparse on west bank.

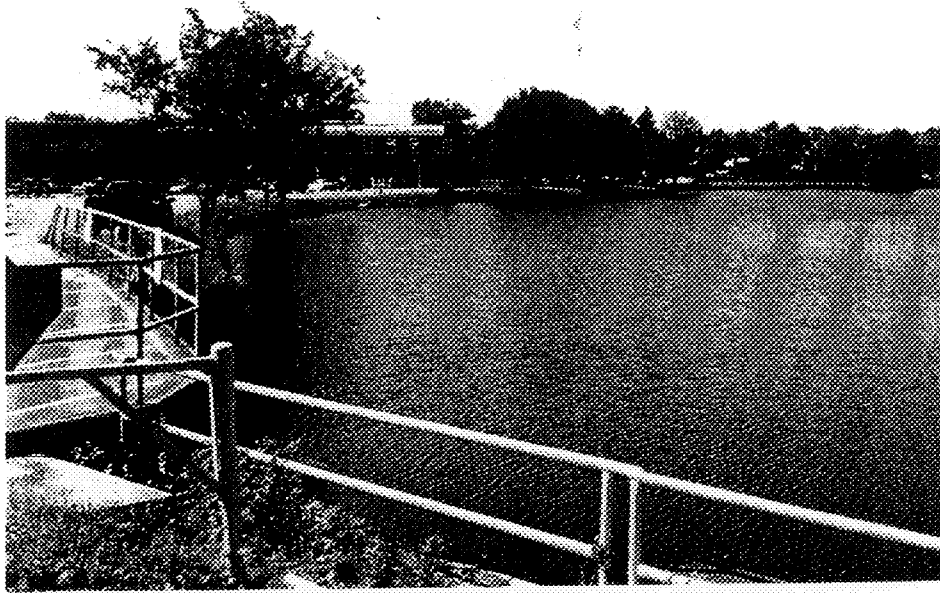


Fig. 29. Same view as fig. 28 in 2000. Purple loosestrife absent on west bank.



Fig. 30. Riverside park in 2000 with purple loosestrife being crowded out by native vegetation.



Fig. 31. Abundant purple loosestrife on west bank of Wisconsin River 100 yards north of the highway 173 bridge in Nekoosa, 1997.

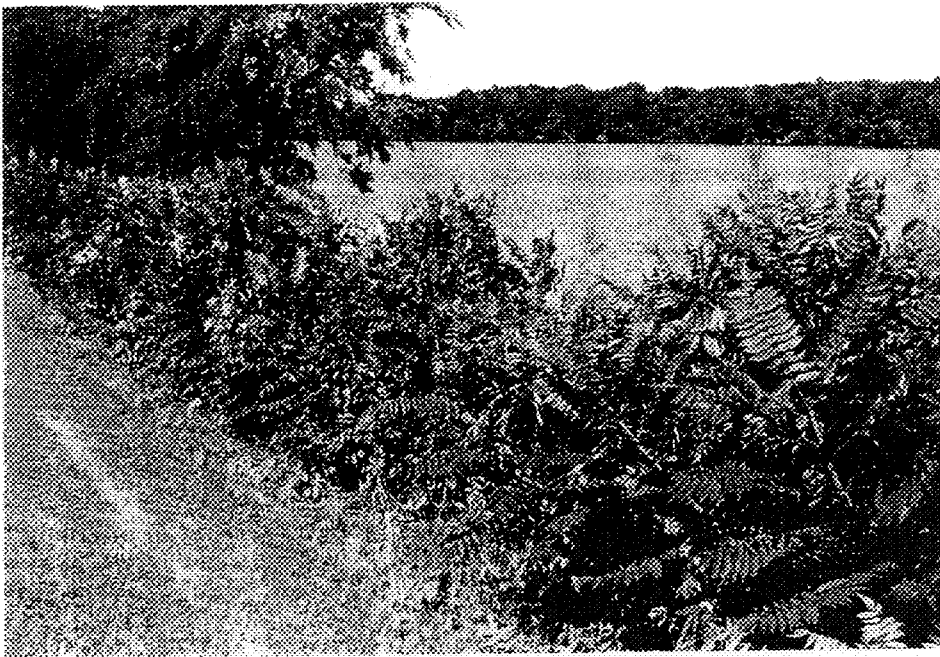


Fig. 32. The same area in 2000, showing staghorn sumac growth overwhelming the purple loosestrife.