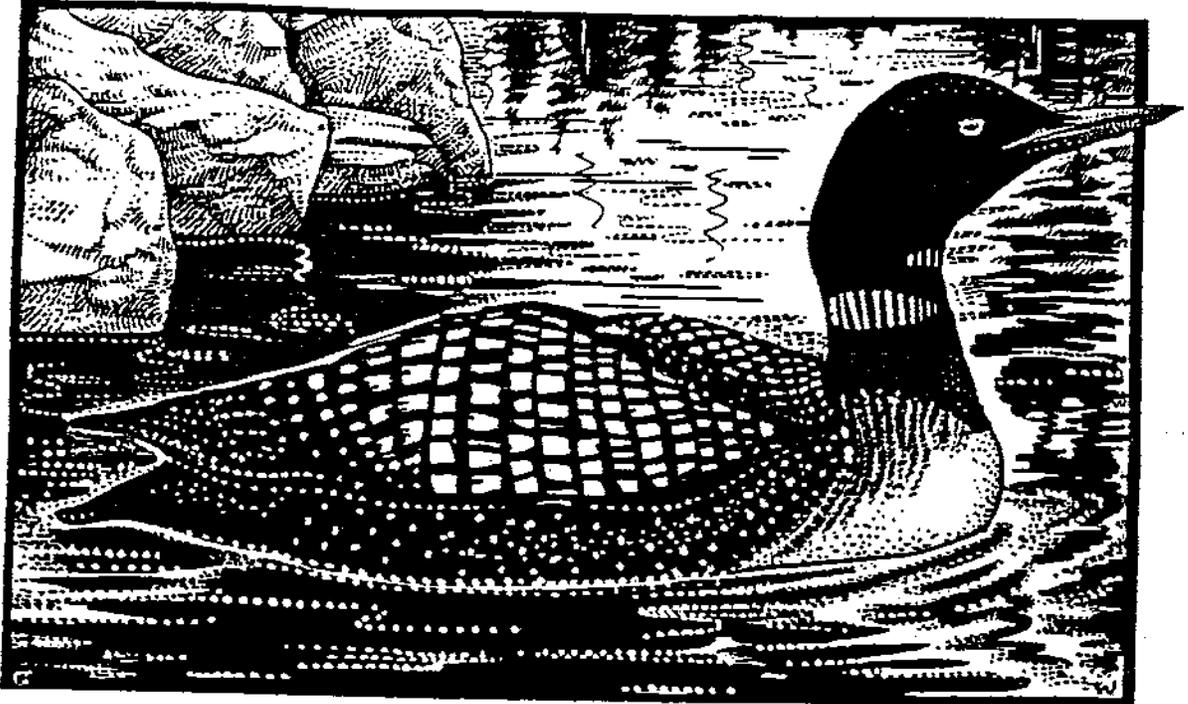


CITY OF TRAVERSE CITY



# BROWN BRIDGE QUIET AREA MANAGEMENT PLAN

FEBRUARY 1993

Prepared by Steve Largent

Revised by Brown Bridge Advisory Committee May 2002

## ACKNOWLEDGEMENTS

In the original writing of the Brown Bridge Management Plan, as prepared by Steve Largent, he made the following acknowledgments:

The following individuals deserve special thanks for their kind consideration of Brown Bridge.

**City Commission:** Peter Taylor, Linda Johnson, Suzanne Antosh, Jack Boynton, Carol Hale, Jim Tompkins, and Jasper Weese.

**Brown Bridge Advisory Committee (1992/93):** June Mason, Erie Heermann, Tom Pangborn, Gary Hansen, Leonard Graf, Carol Hale, Bob Lepisto, Ann Rogers, Harry Lund, Guy Wood, Keith Baker, Rick Stein, and Mac McClelland.

**Governmental Center:** Richard Lewis, Jo Rundio, Patti Sandtveit, Peter Doren, Linda LaCross, Debbra Curtiss, Debbie Bowman, Lisa Sarto, Duane Brege, Ed Montague, David Green, Mike Weiglein, Paula Helminiak, Orv Richard, Russ Soyring, Chris Zezulka, Bill Twietmeyer, Bruce DeJong, and Cathy Watkoski.

**Department of Public Services:** Mike Slater, Rich Durkin, Gordon Zoulek, Bernie Fleetwood, Ray Plamondon (retired), Lauren Vaughn, Mike Flees, Carla Wood and everyone in the garage.

**City Light & Power:** Chuck Fricke, Tom Miner, Ethel Reh, Bob Beagle, Barb Schwartz, and Dutch Stevens.

**Zoo:** Ken Gregory

**Front Cover:** Loon drawing by local artist Glenn Wolff.

**Michigan Department of Corrections:** Camp Pugsley, Kingsley, Michigan. Deputy Warden, Sue Carr; Lt. Michael Michelson; work crew supervisor, Bob Snyder and Crew 6.

Harry Lund and Ann Rogers, Brown Bridge Advisory Committee members; Clayton Sporre, a local historian, and Edna Sargent all deserve particular notice for their efforts detailing the history of Brown Bridge. Gratitude also goes to Ted Cline of Photair Inc.

Finally, special thanks to Bob Snyder, Mike Slater, June Mason, Peta Williams, Tom Adams and my wife, Sharon Largent for their friendship and guidance.

**FRONT COVER:** Loon drawing by local artist Glenn Wolff.

**May 2002 revisions to original Plan were accomplished by the Brown Bridge Advisory Committee 2001: Beverly Cuthbert, Chair; Jim Cooper, Joseph Elliott; Joe Evancho; Mike Gravlin; Susan Gressens; John Hagen; Jennifer Hutchinson; Richard Lewis; Connie Leutloff; Ann Rogers; Mike Slater; Rick Stein**

**Manager/Caretaker: Wally Chappel**

### FORWARD

In 1991, the City of Traverse City contracted with Gary Reese, President / Ecologist, Midwest Biosurveys, to conduct a Natural Area Evaluation and Wetland Floristic Inventory of the Brown Bridge Quiet Area. The objectives of his report were to provide for the Quiet Area:

- 1) a comprehensive inventory of the wetland flora,
- 2) a reconnaissance inventory of the dominant upland flora,
- 3) a plant and natural community classification and mapping of the boundaries of each type,
- 4) a natural quality evaluation of the area, and
- 5) management recommendations for proper stewardship of any sensitive natural resources identified.

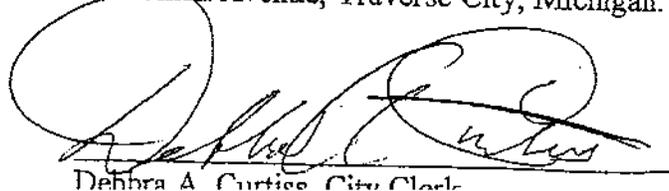
Portions of Mr. Reese's report are inter-woven throughout this document. A complete copy of his report may be viewed by contacting the City Manager's office, City of Traverse City.



**RESOLUTION ESTABLISHING THE  
BROWN BRIDGE ADVISORY COMMITTEE  
AS A TWELVE-MEMBER COMMITTEE**

- WHEREAS, the Brown Bridge Advisory Committee (the Committee), was established by the City Commission on October 4, 1993; and
- WHEREAS, according to the Management Plan for the Brown Bridge Property, it was recommended to the City Commission that the Committee be appointed with the Committee to meet quarterly; and
- WHEREAS, the Committee was established to make recommendations to restore, preserve, and protect the integrity of the Brown Bridge Property to serve under the direction of the City Manager; and
- WHEREAS, when the Committee was established by the City Commission on October 4, 1993, it was formed as an eleven member committee; and
- WHEREAS, the original Management Plan suggests that twelve members serve on the Committee; and
- WHEREAS, it is requested by the Traverse City Light and Power Board that the City Commission establish a seat on the Committee designated to be nominated by the Traverse City Light and Power Board; now, therefore be it
- RESOLVED**, that the City Commission hereby establishes the Brown Bridge Advisory Committee as a twelve-member committee with no less than 50 percent of the members to be City residents and one member to be nominated by the Traverse City Light and Power Board, this Resolution to supercede the October 4, 1993, action of the City Commission establishing the Committee as an eleven-member committee.

I hereby certify that the above resolution was adopted by the City Commission for the City of Traverse City at its regular meeting held on June 4, 2001, within the Commission Chambers, Governmental Center, 400 Boardman Avenue, Traverse City, Michigan.



Debra A. Curtice, City Clerk

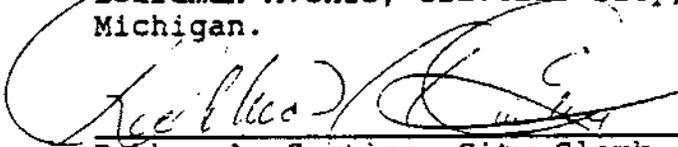


**RESOLUTION  
OF COMMITMENT OF SUPPORT  
FOR BROWN BRIDGE QUIET AREA**

- WHEREAS,** when the City of Traverse City allowed the exploration for oil and gas on the Brown Bridge property, the City promised that it would be done in a sensitive and cautious manner as to least disturb the environment; and
- WHEREAS,** the City of Traverse City is cognizant of the marvelous beauty and splendor of the Brown Bridge area that the City wishes to restore, protect, and preserve the integrity of the natural environment and its inhabitants; and
- WHEREAS,** the City of Traverse City wishes to allow the Brown Bridge Quiet Area to be managed and maintained in such a manner that many generations of citizens may enjoy this area;
- WHEREAS,** the City of Traverse City shall establish a separate Budget Line Item entitled Brown Bridge Maintenance.

**BE IT THEREFORE RESOLVED,** that the City of Traverse City is committed to protecting and preserving the Brown Bridge Quiet Area and will reflect this commitment through a conscious effort to fund such activities each year.

I hereby certify that the above resolution was adopted by the City Commission of the City of Traverse City at its July 1, 1991, regular meeting held in the Commission Chambers, Governmental Center, 400 Boardman Avenue, Traverse City, Michigan.

  
Debra A. Curtiss, City Clerk

## RESOLUTION

WHEREAS, it is in the interest of the citizens of Traverse City to conserve, protect and manage the City owned property at Brown Bridge Pond, which property is described as:

All of Section Fifteen (15) and Section Fourteen (14), except for the North One-Half (N 1/2) of the Northeast One-Quarter (NE 1/4) of Section Fourteen (14), East Bay Township, and the Northeast One-Quarter (NE 1/4) of the Northwest One-Quarter (NW 1/4) of Section Twenty Two (22), Paradise Township, all in Town Twenty Six North (T26N), Range Ten West (R10W), Grand Traverse County, being approximately 1,240 acres; and

WHEREAS that portion of the Brown Bridge Pond property described as Brown Bridge Pond, the Boardman River, the wetlands and lowlands adjacent to said river and pond and the slopes leading to the upland ridge with a buffer strip beyond, being a part of the "Non-Development Zones" designated in Figure 5, pages 35 and 36, of the November 17, 1976 Commonwealth Associates, Inc., report entitled "Environmental Assessment and Guideline for Hydrocarbon Development of the Brown Bridge Pond Site", which area is outlined in red on the attached plan, represents an especially ecologically sensitive area of special quality and importance; and

WHEREAS it is contemplated that the citizens of Traverse City may approve the leasing of said Brown Bridge Pond property for oil and/or gas exploration and development in the April 4, 1977 referendum on the question of whether to lease said property.

NOW THEREFORE be it resolved:

1. That the above described "especially ecologically sensitive area" of the Brown Bridge Pond property is hereafter dedicated as a natural area for quiet recreation.
2. That any oil and/or gas lease of the Brown Bridge Pond property shall provide for the exclusion of all oil and/or gas exploration and development activity, except for geophysical operations, on that portion of the Brown Bridge Pond property designated "Non-Development Zones" in the report by Commonwealth Associates, Inc.
3. That a committee will be established to advise the City Commission of Traverse City as to a plan for the management of the Brown Bridge Pond property consistent with paragraphs 1 and 2 of this resolution. In addition to proposing said management plan and aiding the Commission in such other Brown Bridge Pond related matters as the Commission may request, the committee shall prepare rules and regulations to implement said management plan.

**#20548 - RESOLUTION DEDICATING BROWN BRIDGE POND PROPERTY  
AS NATURAL AREA FOR QUIET RECREATION.  
REGULAR MEETING - 3-21-77**

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SECTION 1



## EXECUTIVE SUMMARY

This Brown Bridge Management Plan is the compilation of several efforts over the years including a Site Inventory and Evaluation (1975) conducted by George Ferrar, Resource Conservation & Development (RC&D); a Critical Area Treatment Plan (1988) drawn up by Tom Adams, District Conservationist, Soil Conservation Service (SCS); and a Natural Area Evaluation and Wetland Floristic Inventory (1991), by Gary Reese, Ecologist, Midwest Biosurveys. In addition, the general public and a citizen based Brown Bridge Advisory Committee have had extensive input in the development of this plan.

Two other forest management plans were written for Brown Bridge by Pere Marquette State foresters in 1953 and 1963. Both plans focused on the consumptive value of harvesting timber off the property and lacked an integrated management view.

When Mr. Ferrar wrote his plan over 17 years ago, the City of Traverse City was contemplating drilling for oil on the 1240 acre, City-owned property. The following is a summary of what has occurred at Brown Bridge since that time.

On April 4, 1977 the citizens of Traverse City approved a ballot proposal to allow drilling for oil & gas on the Brown Bridge property. As we all know, the City did drill and strike oil. To date, the gas & oil revenue from the four City-owned wells at Brown Bridge has placed approximately six million dollars into the Brown Bridge Trust Fund. Annually, the trust fund generates close to a half million dollars (over 2.5 mills) in interest revenue; the revenue is then placed into the General Fund to offset taxes and fund City-wide operations.

A month prior, the City Commission passed a resolution dedicating Brown Bridge as a "Natural Area for Quiet Recreation" (Appendix \*\*\*\*). The resolution also stated the City's intent to appoint a citizen based Brown Bridge Management Plan Committee. On December 5, 1977 the City Commission adopted a resolution establishing that Committee and the very next meeting appointed the following members:

Peter "Peta" Williams, Chair  
Gerald "Buck" Williams (no relation to Peta)  
George Ferrar  
William McGarry  
Gary Hansen  
Richard Murphy  
Roland Hesselbart  
June Mason \*

\* Retained by the City as an Environmental Consultant

The charge of this committee was to plan for the land management of the property. The property was beginning to show signs of misuse including trash and severe erosion caused by ORVs. The Committee established interim rules for the area including: No camping; No fires; and No Motorized Vehicles. The City Commission adopted these interim rules for Brown Bridge on May 15, 1978.

In the years following, the Management Plan Committee slowly disbanded and, except for the perseverance and dedication of a few individuals, Brown Bridge may have become forgotten land. June Mason, Peta Williams, Buck Williams and Gary Hansen all deserve immense gratitude for their diligence in not letting the City forget their obligation to Brown Bridge. If not for their efforts, Brown Bridge would have continued to deteriorate.

In 1986, responding to an earlier correspondence by June Mason, the City Commission appointed the following members (including some from the original Committee) to the "new" Brown Bridge Advisory Committee:

- \* Peta Williams
- \* Buck Williams
- \* June Mason
- \* Gary Hansen
- Leonard Graf
- Robert Lepisto
- Tom Pangborn
- Eri Heermann
- \* Original Management Plan Committee members.

Again the charge of this Committee was to oversee the proper land management of the property.

In 1988, Tom Adams, SCS, wrote a Critical Area Treatment Plan (CATP) for Brown Bridge and the City of Traverse City. The purpose of his plan was to give the City direction in correcting existing erosion problems and to prevent further ones from occurring. Later that same year, the City hired myself as Project Coordinator to implement the CATP using Michigan Youth Core labor. Until that time, the City placed very little revenue back into maintaining and protecting the property.

On May 1, 1989 the City Commission authorized a contract with the Michigan Department of Corrections (MDOC) to use Camp Pugsley work crews at Brown Bridge. A key element to the success of the project to date, since implementation of the CATP requires extensive hand labor, has been the utilization of this prison work crew under the direction of MDOC officer Bob Snyder.

During 1991, the Brown Bridge Advisory Committee went through many changes. In January, long time Advisory Committee member and City Commissioner, Buck

Williams passed away while ice-fishing. Another long time Advisory Committee member, Peta Williams, resigned. Both were original Management Plan Committee members and each had served Brown Bridge for 14 years.

To replace Buck Williams, the City Commission appointed veteran, fellow City Commissioner Carol Hale as their representative on the Advisory Committee. Five citizens were selected by the City Commission to replace Peta Williams and to insure a broad-based input in the development of the management plan.

The new members included:

Guy Wood  
Mac McClelland  
Harry Lund  
Kenneth Baker  
Ann Rogers

During the fall of 1992, long time committee member Gary Hansen, resigned and Rick Stein, previously an advisor to the committee, was selected to fill the vacancy. Tom Adams, Mike Slater and Bob Snyder serve as advisors to the Committee.

On July 1, 1991, the City Commission reaffirmed their support of Brown Bridge through a resolution of Commitment.

Management of Brown Bridge is imperative. Public lands cannot survive the "draw the line and leave it alone" philosophy. As land managers, we are challenged to maintain the ecological process and natural conditions as well as provide for outstanding primitive recreational opportunities and solitude. This is not an easy task.

To accomplish this, the Advisory Committee first developed a Vision Statement then determined the desired future condition (DFC) of the Quiet Area. With that in mind, they were then able to establish objectives for the conditions sought, then develop management strategies where these objectives were not being met.

Most management plans say what should be done, but not how to go about doing it. The intent of this plan is to give the City of Traverse City direction as to how to obtain these objectives. This is an open ended plan that should be continually updated as new information is received.

In 2001 the Advisory Committee reviewed the original management plan reflecting the progress and changes that have occurred in the past few years. In May 2002 the Traverse City Commission approved the recommended revisions and updates.

## VISION STATEMENT

"Restore, preserve and protect the integrity of the natural environment, including its inhabitants, yet allow managed public use for generations to come".

## DESIRED FUTURE CONDITION

Preserve the area in a natural state, while offering a quality, "quiet area" recreational experience...A low-profile place that delicately enhances the users knowledge and appreciation of the peace and beauty of nature; cautioning not to move too fast to "civilize" any of the area.

\*Developed through a questionnaire given to the Brown Bridge Advisory Committee. Comments and results of the questionnaire can be obtained by contacting the City Managers office.

## MANAGEMENT AREA

### Coverage Area

The management recommendations contained in this document pertain to all property owned by the City of Traverse City in sections 13, 14, and 15 of East Bay Township and section 22 of Paradise township, Grand Traverse County, known as the Brown Bridge Quiet Area.

### Core Area

The Core Area is described, as All City owned land south of Hobbs Highway and Ranch Rudolph Road, and north of Brown Bridge Road, extending to the east and west property lines of the Quiet Area (Figure 1).

## OBJECTIVES

Specific Objectives include:

1. **Acquire a Conservation Easement for the Brown Bridge Quiet area by end of 2002 to assure protection of the property in perpetuity.**
2. **Develop rules and regulations for the Quiet Area.**
3. **Actively pursue connecting Brown Bridge and Scharman Roads via Greenbelt Road to facilitate the eventual closing of Brown Bridge Road through the Quiet Area.**
4. **Develop and plan for the use of the "Prevo" Cabin and out building by 2003.**
5. **Continue a City Commission appointed Brown Bridge Advisory Committee under the direction of the City Manager to insure that the project objectives and goals are being accomplished in a timely and prudent way. The Committee will also continue to solicit public input and amend the Management Plan and Work Plan accordingly.**
6. **Coordinate research projects at Brown Bridge utilizing college graduate and post-graduate students to maintain and encourage biological diversity of both native plant and animal communities. Continue to amend both the terrestrial and aquatic plant and animal species lists as new species are encountered. Implement an exotic weed control program to ensure maintenance of native plant communities.**
7. **Develop a management strategy that realizes and addresses the several diverse values of wildlife including the biological, the consumptive and the non-consumptive values.**
8. **Develop trail system and install a best management practice that directs human activity away from, and protects sensitive areas as set forth in this Management Plan.**
9. **Encourage wildlife, environmental, natural feature and historical education through literature, guided tours, interpretive signs, and historical displays.**
10. **Work with local law enforcement officials to develop an effective system to enforce Quiet Area rules once established.**
11. **Have entire boundary of Quiet Area surveyed.**
12. **Secure, through acquisition or conservation easements, important lands adjacent to the Quiet Area. Work with the State of Michigan, Rotary**

**Camps, Inc., and private landowners to coordinate management of adjacent lands.**

**To accomplish many of the objectives outlined above, a six-year work plan was developed and coordinated with the City's revised Recreation Plan. This work plan also coincides with the City's current 1999-2005 Capital Improvement budget.**

## MANAGEMENT RECOMMENDATION SUMMARY

(Further information concerning the management recommendations listed below can be located in Section 3 of this report. Please note the location in the outline for a specific recommendation, and then refer to Section 3 of the Table of Contents for the page number.)

### I. FOREST MANAGEMENT

#### A. Community Type Management

##### 1. Natural Communities

###### a. Emergent Marsh

- manage for wildlife;
- discourage human activity;
- visually monitor Perch Lake marsh.

###### b. Northern Wet Meadow

- manage for wildlife;
- discourage human activity.

###### c. Northern Shrub Thicket

- manage for hiking and wildlife;
- limit human activity in areas of severe limitation.

###### d. Rich Conifer Swamp

- manage for wildlife;
- limit human activity in areas of severe limitation.

###### e. Poor Conifer Swamp

- manage for wildlife;
- discourage human activity.

###### f. Hardwood-Conifer Swamp

- manage for wildlife and limited hiking;
- limit human activity in areas of severe limitations.

###### g. Mesic Northern Forest

- manage for hiking and wildlife.

###### h. Dry-Mesic Northern Forest

- manage for hiking and wildlife.

###### i. Dry Northern Forest

- manage for hiking and wildlife.

##### 2. Artificial Communities

###### a. Brown Bridge Reservoir

- see Fisheries/Reservoir Management for recommendations.

###### b. Oil Well Pads and Clearings

- constantly monitor oil and gas operations to insure lease agreements are upheld (see City Clerk for lease agreements);
- supervise and advise oil and gas companies during reclamation after abandonment;

- manage as forest openings or reforest as according to Appendix "F".
  - c. **Brown Bridge Dam**
    - coordinate all work on earthen dam with City Light & Power officials;
    - monitor impacts of human foot traffic on berm;
    - work with L&P personnel to alleviate occasional wood chuck and beaver problems in ways consistent with Quiet Area guidelines.
  - d. **Lawns and Old Agriculture**
    - eliminate lawns except around caretakers residence;
    - maintain old agriculture fields as forest openings.
  - e. **Red Pine Plantation**
    - manage for saw logs.
  - f. **Old Logging Roads and Two-Tracks**
    - manage as hiking trails or revegetate;
    - block unnecessary interior roads using hardwood posts.
  - g. **Log Rollway**
    - crib and revegetate utilizing native shrubs as necessary;
    - cover the area with composted leaves to increase soil fertility;
    - continue to monitor log rollway.
- B. Forest Openings and Edges**
- manage so at least 5% of the upland is maintained as forest openings;
  - cut openings to achieve a 3:1 length to width ratio;
  - re-cut abandoned well sites or new forest openings to obtain an irregular edge.
- C. Timber Harvesting**
- harvest to provide wood products for use on the Quiet Area only;
  - harvest aspen and red pine as outlined in management plan;
  - utilize horses or other non-mechanical means of harvesting if possible.
- D. Aspen Management**
- initiate a forty year cutting rotation involving 5 acre blocks to regenerate young aspen stands;
  - cut openings (with irregular edges) to achieve a 3:1 length to width ratio;
  - length of cut should lay north to south.

#### **E. Insect Control**

- implement future recommendations by the Gypsy Moth coordinator at the GTCD;
- investigate ways to control exotic species that pose a threat to Brown Bridge.

#### **F. Non-Native (Exotic) Plant Control**

- prohibit the planting of non-native species without prior approval of the Advisory Committee;
- compile a pictorial reference chart of the most commonly encountered exotic species in the area;
- where feasible, pull individual exotic plants when encountered;
- monitor wetland areas closely for the presence of purple loosestrife;
- eradicate all autumn olive shrubs from the property;
- examine boardwalk area and trails closely for individual exotic plants introduced by human activity;
- continue to use leaf mulch from the City streets to stabilize eroding banks;
- avoid spraying herbicides unless authorized by the advisory Committee;
- allow certain naturalize herbaceous exotic plants to grow (maybe impractical to eradicate);
- allow Norway Spruce and Blue Spruce already planted on the property to grow.

#### **G. Demonstration Planting**

- plant additional demonstration plots utilizing other native shrubs such as Chokecherry, American Elderberry, and Pincherry;
- record percent survival, general height and health of each plant every year;
- maintain area from encroaching forest edge and non-native plants.

## **II. WILDLIFE MANAGEMENT**

### **A. Game Species**

(See Appendix "H" for species-specific management recommendations of game animals)

#### **1. Hunting/Trapping**

- allow hunting and trapping at Brown Bridge except in the "core area" (Appendix "H") unless for management purposes;
- prohibit permanent or fixed (structural) blinds;
- prohibit blinds within obvious sight of trails, overlooks,

waterways, and roads;

- no vegetation, dead or alive, may be cut to construct a blind;
- prohibit baiting to attract wildlife;
- review hunting and trapping plan on a yearly basis;
- hunting by permit only in Sargent/Prevo property (Grasshopper property).

## **B. Special Concern Animals**

### **1. Endangered or Threatened Species**

#### **a. American Bald Eagle**

- if nest is suspected, exclude human activity within a 500 foot area around the nest;
- manage area for greater number of waterfowl;
- improve fisheries habitat on reservoir.

#### **b. Osprey**

- determine if nesting osprey are desired (they directly compete with Bald Eagles and may exclude the latter from nesting);
- to create a potential nest site either;
  - remove the top of a large white pine by using dynamite or a chainsaw;
  - build an artificial structure;
- improve fisheries habitat on reservoir;
- allow electric motors only on reservoir.

#### **c. Common Loon**

- construct an artificial floating nest structure;
- improve fisheries habitat on reservoir;
- reduce non-native mute swan populations;
- allow electric motors only on reservoir to reduce wave disturbance;
- place buoys around nesting area to alert fishermen.

#### **d. Red-shouldered Hawk**

- work with MDNR to leave uncut buffer zone of at least 500 feet south of Scharman and Brown Bridge Road in sections 22 and 23 of North Paradise township;
- maintain uncut lowland habitat;
- leave uncut buffer zone of at least 500 feet completely around suspected and known nest sites.

#### **e. Wood Turtle**

- do not establish "cleared" trails within 500 feet of the Boardman River (Reese 1992) within open field areas (Grasshopper Ranch);
- create small irregular-shaped nest areas, void of all vegetation;
- maintain open field habitat by clearing encroaching

- weedy vegetation and non-native plants;
- place sign near nesting area to educate visitors about wood turtles;
- compile a pictorial reference chart of all turtles found, or suitable habitat that exists for their presence.
- f. Eastern Box Turtle
  - maintain forest clearing and shady area below the hill (1000 feet west of the east line of section 14) just north of Brown Bridge Road.
- g. Spotted Turtle
  - continue to search for their presence.
- 2. Other species
  - a. Barred Owl
    - maintain snag trees and uncut lowland forests.
  - b. Mute Swan
    - work with the MDNR to remove Mute Swan populations.
  - c. Trumpeter Swan
    - work with the MDNR to investigate introducing Trumpeter Swans at Brown Bridge.

### **III. FISHERIES / RESERVOIR MANAGEMENT**

#### **A. Reservoir Fishery**

- do not plant Walleye in the reservoir;
- do not have Brown Bridge Reservoir declared trout waters;
- encourage research on River-Brown Trout mortality due to ice fishing;
- if data supports, pursue a MDNR Commission Order to enact strict regulations on ice fishing for trout on the reservoir;
- investigate dredging the sand sediment from the east end of the reservoir to improve aquatic habitat;
- investigate all management opportunities with MDNR Fisheries Division, including no size limits on Pike and elimination of winter fishing for Browns;
- encourage research to determine all the impacts to the area, including off-site impacts, if Brown Bridge Dam were ever removed;

#### **B. Wiggler Digging**

- eliminate wiggler digging on the pond.

#### **C. River and Stream Tributaries**

- improve fisheries habitat on main portion of the river by dredging the east end of the reservoir;
- encourage large organic debris in the river upstream of the reservoir to improve fisheries habitat;
- repair existing and new streambank erosion areas;
- work with City Light and Power officials to develop an alternative method to measure seep volume from the earthen dam, then remove concrete weirs on tributary below Brown Bridge Dam.

#### **IV. RECREATION / TRAILS AND MAINTENANCE**

##### **A. Current Trails**

- manage trails for hiking and cross country skiing;
- do not allow motorized vehicles, horses, or no motorized bikes on any trail other than Brown Bridge Road (except authorized emergency and maintenance vehicles);
- replace wood chips on designated chipped trails as needed;
- inspect trails for fallen trees and limbs in the spring and after heavy winds or storms;
- remove dangerous branches and trees hanging over trails;
- position cut ends of trees so that it does not appear unnatural along the trail;
- clear Poison Ivy from trails whenever encountered.

##### **B. Proposed Trails**

- develop trail system according to Work Plan;
- heed public input on the trail system.

##### **C. Brown Bridge Road Closure and Trail Development**

- actively pursue connecting Brown Bridge and Scharmen Roads in section 13 (East Bay Twp) via greenbelt Road;
- close Brown Bridge Road on City property, from Scharmen Road to the east line of section 14;
- create wildlife openings and Aspen cuts as desired prior to removing gravel;
- construct parking areas at each end of the closed portion of the road;
- from West end parking area, leave gravel base for disabled persons trail (Figure 9);
- level and wood chip remaining portion of former road bed;

- intersperse native wildlife shrubs along new trail;
- allow hiking, skiing, horseback riding and non-motorized bikes on this portion of the trail.

#### **D. Trail for Disabled Persons**

- provide a wheelchair accessible river fishing area and canoe loading area on the north side of the river after the foot-bridge is installed below the dam;
- make the East Overlook wheelchair accessible from the East Parking lot.

#### **E. Areas for Potential Trail Development**

- appendix "J" contains a map of potential trail development areas;
- examine the area closely for the presence of any threatened or protected plant or animal species before new trail development begins.

#### **F. Coordinated Management of Surrounding Public Lands**

- work with Rotary Charities, Grand Traverse County, and the MDNR to coordinate the overall management (timer, wildlife, aquatic and recreation) of properties adjacent to Brown Bridge;
- do not implement trail linkages as proposed in Grand Traverse County's Master Trail Plan.

#### **G. Parking**

- disperse recreational use by offering several small parking areas at Brown Bridge (Figure 9);
- construct parking areas at each end of Brown Bridge Road after closure;
- work with City Light and Power personnel to coordinate snow removal on the East and West Parking Areas on the north side and the Boat Launch and Canoe Portage Parking Areas on the south side.

#### **H. Restrooms**

- do not provide restroom on north side of property at this time.

#### **I. Camping**

- camping should not be allowed on the Brown Bridge Quiet Area property.

### **V. SIGNS / TRAIL MAPS**

#### **A. Signs**

- do not sign the entire perimeter of the property until a survey has been completed;
- place wood routed interpretive, informational, and directional signs at appropriate locations;

- utilize used power poles to mount interpretive, informational and trail signs on;
- use used power of red-pine logs, with 4" tops then CCA treated to a .60 retention as boundary sign posts;
- do not allow individual, private or commercial signs on Brown Bridge property.

#### B. Trail Maps/Brochures

- place permanent trail maps at all parking areas to direct visitors;
- informational brochures are discouraged at this time.

### VI. INFORMATION / EDUCATION / RESEARCH

#### A. Nature Center/Education

- foster and support the concept of a future nature center at the Grand Traverse Natural Educational Reserve;
- employ the use of interpretive signs to educate Quiet Area users of the many natural and historical features found at Brown Bridge.

#### B. Historical

##### 1. Brown Bridge Area History

- apply to have the location of the historic Brown's Bridge and the Old State Road declared a State Historic Site;
- further research the presence of the Half-Way House and possibly have this declared a State Historic Site along with the original Brown's Bridge site;
- investigate the history of the Grasshopper Ranch;
- investigate and possibly rebuild the bear cage on the Grasshopper Ranch property;
- continue research on all the past cultural aspects of Brown Bridge.

##### 2. Archeology

- Brown Bridge personnel should be trained to recognize clues of potential archeological sites;
- do not disturb the soil if a probable site is found;
- contact the Michigan Department of State for a list of qualified consultants.

#### C. Research

- encourage research of Brown Bridge's natural and cultural features;

- utilize college graduate and post-graduate students to conduct the research;
- all research activities must have the Advisory Committee's prior approval;
- continue to update flora and fauna species lists as new species are encountered.

## VII. Administration/Misc. Operations

### A. Property Conservation

- acquire a Conservation Easement for the Brown Bridge Quiet Area by end of year 2002 to assure protection of the property in perpetuity.

### B. Governing Body

- the city of Traverse City should retain ultimate management control of Brown Bridge;
- continue the agreement with the G.T. Conservation District to manage and execute the Quiet Area Management Plan every three years.

### C. Brown Bridge Advisory Committee

- maintain a Brown Bridge Advisory Committee under the direction of the City Manager;
- the committee size should be 12 people with half being residents of the City of Traverse City;
- tenure will last three years with staggered appointments;
- the Committee should meet quarterly unless otherwise notified by the chairperson.

### D. Caretaker

- maintain a full-time, on-site caretaker at Brown Bridge;
- continue to coordinate this position with the G.T.; Conservation District and City Light & Power; caretaker should have the authority to issue "appearance" notices for Quiet Area violations.

### E. Rules

- develop rules and regulations for the Quiet Area.

### F. Enforcement

- caretaker should have the authority to issue "appearance" notices for Quiet Area violations;
- purchase a video camera to record area violations.

### G. Emergency Access

- distribute an Emergency Access Map (Appendix "K") with a key to all appropriate emergency

response units;

- support the concept that East Bay Township's emergency response area be expanded to Scharman Road once Brown Bridge road is closed.

#### **H. Group Use**

##### **1. Group Tours**

- discourage large group use, or encourage only during low-use hours (i.e. weekdays);
- a guide or naturalist should assist the group.

##### **2. Group Events**

- should have prior reviews by Advisory Committee.

#### **I. Publicity**

- discourage publicity of Brown Bridge for as long as possible to protect the serenity and solitude to those who "discover" the Quiet Area.

#### **J. Labor**

- continue to utilize prison labor from Camp Pugsley as in years past
- work with the Grand Traverse Conservation District to "share" this crew with other projects.

#### **K. Buildings**

- remove current caretaker residence and rebuild south of current site near Brown Bridge Road;
- develop a plan for future use of Prevo Cabin by 2003.

#### **L. Property Acquisition and Easements**

- secure critical lands surrounding Brown Bridge through purchase or by encouraging conservation easements.

#### **M. Endowment Fund and Memorial Gifts**

- establish an endowment fund to provide a vehicle for people to leave financial gifts for the future development of land acquisition of the Quiet area;
- the committee should review and make recommendations to the city regarding financial gifts.

### **VIII. Monitoring Plan**

#### **A. Human**

- conduct public meetings, accessible to the disabled, as deemed necessary by the Advisory Committee.

#### **B. Wildlife**

- encourage research to up date species lists both aquatic and terrestrial;

- keep daily species lists to help determine relative abundance of wildlife population;
- develop and implement yearly (deer) browse surveys;
- require trappers to record all animals trapped on the property with designated Quiet Area personnel;
- develop a questionnaire to be placed at Buck's landing to keep track of fishing success and relative fish abundance;

C. Flora

- encourage research to update plant species lists both aquatic and terrestrial;
- solicit knowledgeable persons to conduct orchid surveys and counts as deemed necessary by the Advisory Committee.



SECTION 2



## HISTORY OF THE BROWN BRIDGE AREA

Much of what you'll read in the following paragraphs comes from the "Currents of The Boardman", a magnificent and intriguing historical look at the Boardman River Valley. The Boardman River Historical Committee compiled this document; it was published in 1982 by the Grand Traverse Historical Society.

Martin Melkild, Chairman of the Historical Committee at that time writes, "Long before Captain Harry Boardman (after whom the river is named) first visited the Grand Traverse Region, the river that flowed so crystal clear into the west arm of Grand Traverse Bay had another name...a name called the 'Ottaway'". The river was named after a great local tribe of Indians, the Ottawas, who inhabited the Grand Traverse Region along with the Chippewa Indians when the first white missionaries arrived in 1839.

During this time, the Boardman River Valley and the Brown Bridge Area was home to a variety of wildlife species such as elk, lynx, beaver, otter, fisher, and black bear. Wolves and mountain lions were also fairly common, but were hunted and trapped for the bounty and vanished from the area about 1880.

### Lumbering Days

In 1851, Perry Hannah bought out Captain Boardman, who arrived three years prior, for the timber rights on the Boardman. Hannah and Tracy Lay ruled as "lumbering kings" of the area until 1886. For the first twenty years, Hannah and Lay's lumberjacks used ox teams to haul the logs to rollways for the spring log drives. One of these rollways is still noticeable on the north bank at Brown Bridge, next to the East Overlook (Photo \*\*\*).

Around 1870, horse teams replaced the oxen and, still later, came the narrow gauge railroad to move the timber to the sawmills. The old incline-railroad grades are still visible on the north bank of Brown Bridge, and in fact, serve as part of the Quiet Area's hiking trail system (map \*\*\*).

### Brown's Bridge

In 1869, William Walter Brown a lumberman, purchased eighty-acres from the State of Michigan for \$50.00. As more and more families settled in the Boardman River Valley, a need for a bridge to travel across the river grew. Delegated by his neighbors, Mr. Brown went to the county government to ask for permission and funds to build such a bridge. Though no funds were available, the county did give Mr. Brown permission to construct a bridge with the provision that they built the bridge high enough for lumbermen to float logs down the river. Mr. Brown and his neighbors constructed the bridge on their own, hence the name Brown Bridge.

The Browns were known as a "boisterous clan". Its been told that when the law was after them, they would tumble down the log rollway (next to what is now the East Overlook site), to escape.

The Browns were attracted by a naturally-flowing spring where they eventually built a water powered mill next to the river. From this mill they carved many of the wooden porch-pillars found on some of the historic homes in Traverse City. During the stagecoach days, Brown Bridge was the site of an inn called the "Half-Way House", which was named for its mid-point position between Grand Rapids and the Straits. Here, hostlers would seek rest and change tired horses for fresh ones.

#### State Road

Brown's Bridge was the river crossing for the old State Road, which until 1873, was used by wagons to haul supplies over the hills to and from Traverse City. After this time, supplies were hauled in by railway, but travelers still utilized the State Road as a their main route to reach the Traverse City area.

#### Hydro-Electric

In 1905, a group of local citizens purchased 40 acres at Brown Bridge for Queen City Light and Power. In 1912, the City of Traverse City purchased Queen City Light & Power and with it the flowage rights of the river to what would become Brown Bridge Dam. This was the beginning of Traverse Municipal City Light and Power.

In 1917, Traverse City Light & Power appointed William Love, an electrical engineer, Superintendent, a position he held until retirement twenty years later. Mr. Love served as the catalyst to several events at Brown Bridge during his tenure, including the construction of the 2,400 foot earthen dam, built in 1921/22.

Before the dam could be built, the City of Traverse City called an election to ask the citizens of Traverse City their approval to borrow the money to build the dam. The results of the election on April 4, 1921: YES - 1,832; NO - 384.

It is interesting to note that the City Commission received a petition from many citizens of Traverse City asking that the work of removing and burning timber from the proposed site be "delayed until spring". They believed there would be a great loss of animal life otherwise.

#### Municipal Forest

Spring of 1925 saw the planting of the first "municipal forest" in the State of Michigan at Brown Bridge under the direction of Mr. Love. It was a community event that saw Mayor James T. Milliken urge "citizens to participate in a notable move to replenish pine, the pioneer pride of Michigan". Through the co-operation of the Izaak Walton League and City authorities, Traverse City set the pace for all other cities in Michigan and the Mid-west. When all was said and done, over 50,000 pine trees were reported planted at Brown Bridge during the 1920's. City Light and Power continues this tradition today.

### State Game Preserve

Also in 1925, the City Commission worked with State authorities to arrange to have "all land owned by the City in the Township of East Bay, not covered by water, set aside as a State Game Preserve for a period of ten-years". The City and the State used the hunting ban to "foster an increase of the birds, rabbits, deer and waterfowl" on the property. The hunting ban ended in 1935 and no reports have been located as to the success of the project.

### 1935-1975

For the next forty years, Brown Bridge grew to be a special place in the hearts of many who visited the area. Whether you were a hunter, trapper, fisherman, bird watcher, horseback rider or whatever, Brown Bridge was the place to do it. The heavily-wooded glacial terrain of the "mini-wilderness" area offered visitors panoramic views of the Boardman River Valley and plentiful wildlife. But as more people discovered the area, damage to the landscape soon followed. People left their trash behind, ruining the pristine experience for others who followed. Many thoughtless ORV operators saw the scenic slopes as challenges for their machines, not for the views they offered.

By 1975, the hillsides were becoming heavily gouged and torn from the misuse, causing tons of sand to crumble down slope. This was the year that Traverse City began the slow trend to reclaim Brown Bridge for future generations. Though the misuse and damage continued for a number of years, the trend turned because of certain events and the efforts of those outlined in the Executive Summary of this report. As outdoor columnist Herb Boldt once wrote, "There are many beautiful bodies of water in the Grand Traverse Area...None, however can hold a candle to Brown Bridge Pond...They say beauty is in the eye of the beholder, but the eye can only disclose one aspect of the pond's charm."



Figure 2

BIRDS EYE VIEW - This photo (courtesy of Edna Sargent) shows Brown Bridge Dam from the old State Fire Tower. Remnants of the old tower, constructed around 1925, can still be found on top of the ridge, directly north of the dam.

## DESCRIPTION OF THE BROWN BRIDGE QUIET AREA

### LOCATION

The Brown Bridge Quiet Area is located on the Boardman River, a State designated Natural River, approximately 11 miles southeast of Traverse City, Grand Traverse County, Michigan. The property encompasses nearly two square miles (1,320 acres) of land (figure 1) with 1,200 of those acres located in sections 14 & 15 of East Bay Township and approximately 70 additional acres that lies contiguous to the Quiet Area along the "Wild & Scenic" portion of the Boardman River in section 13 of East Bay Township. The remaining 40 acres extends south across Brown Bridge Road into section 22 of Paradise Township.

The backwaters of the Brown Bridge Dam, owned and operated by City Light and Power, forms the 191 acre Brown Bridge Pond. The 2,400-foot earth embankment hydro-dam has been generating power ever since its completion in 1922. See RESERVOIR within this section for a complete physical description of the pond.

### Local Population Influences

The Grand Traverse region is one of the fastest growing areas in Michigan. Population figures for 1990 indicate that Grand Traverse County had nearly 65,000 inhabitants, nearly double that of 30 years earlier. The five county area surrounding the Boardman River and Brown Bridge has a resident population of 125,000 and hosts another 125,000 seasonal residents during the summer months.

As a result of this increased population, coupled with additional leisure time and discretionary income, there has been a dramatic increase in recreational pressures on areas that offer quality multiple-use activities such as Brown Bridge.

### Geographical Setting

Reese (1992) points out that to better understand the natural heritage of Brown Bridge we should look at the Quiet Area "in a landscape context". The Brown Bridge Quiet Area lies within the Highplains District, which contains moraine and outwash terrain. He states that the variables used to classify Michigan into regions, districts, and sub districts are climate, physiography and vegetation.

### Presettlement Vegetation

In 1852, Leoniadas Scranton characterized the presettlement vegetation of the Boardman River Valley near Brown Bridge as follows (Reese 1992):

"The (Boardman's River) valley is from one-half to three fourths of a mile in width and is a thicket-swamp. On the west of it the timber has been blown down and there has now grown up among the old timber a small dense growth of cedar, spruce, alder, willows, and aspen. On the north from the river valley the bluff is very regular rising from one hundred to one hundred and

eighty feet high.

East from the valley and north from the river valley and also south from the river valley in the east part of the township (East Bay Twp.) is pine plains and pine openings - between the two branches of Boardman's River (Union Twp.) making it from the south the land is rolling beech and sugar (maple) timbered land over a considerable part of which the fire has run and has now grown up to bushes (and) briars.

On Sections 19, 20, and 21 (East Bay Twp.) there has been a considerable lumbering done. From the northwest corner of section 21 the river has been cleared to the Bay for running logs. It is a brisk stream averaging about 1.30 (chains) in width and 2 or 3 feet in depth."

by Leonidas S. Scranton, Deputy Surveyor  
July 9-27, 1852

Today, in 1992, the Brown Bridge area again supports small dense growths of spruce, alder, willow, and aspen species growing up among the older second growth timber, but cedar regeneration is scarce possibly due to over-grazing by deer.

Reese's (1992) report contains a summary of the original field survey notes.

#### Glacial / Topography

The landscape of Brown Bridge and the Boardman River valley is the direct result of the glacial activities that occurred during the Pleistocene Epoch (approximately 1,000,000 years before present). During this epoch, four major glacial advances completely covered the region. When the last finger of the ice sheet retreated approximately six to ten thousand years ago, it left behind a glacial landscape of end moraines, outwash plains and glacial lakebeds.

Two major physiographic features of the area are the Port Huron and Manistee Moraines. The outer ridge of the Port Huron Moraine, which was formed approximately 12,500 to 13,000 years before present, extends east-west across the southern third of the river basin. The more recent Manistee Moraine was formed as a result of the final ice retreat and lies further to the north. One gully of these two moraines forms the bed of the Boardman River.

The Boardman River, once a tributary to the Manistee River, flows through a 6 to 14 mile wide outwash plain that lays between the two moraine ridges. The topography of this outwash plain is generally undulating with many ridges, sharp valleys and hills (Boardman River Natural River Plan 1976).

#### Climate

The Highplains District has the most severe climate in northern Lower Peninsula of Michigan. It has the shortest, most variable growing

season, considerable snowfall and long lasting winter cold spells. Flat, outwash areas serve as cold air pockets, with major river channels acting as cold air drainages (Reese 1992). Winter temperatures average below freezing, with mean monthly temperatures for January approximately 23E F (Eichmeier 1966). Snowfall ranges from an average of 72.8 inches at Traverse City, to nearly 110 inches in northern Kalkaska County.

During the summer months, the climate in the Boardman River Watershed is favorable for outdoor recreational activities. Summer temperatures may reach as high as 100E F; however, the mean monthly temperature for July is approximately 70E F. The weather is greatly influenced by our proximity to Lake Michigan and Grand Traverse Bay. Both bodies of water tend to modify the area's climatic extremes.

The mean annual precipitation is about 31 inches. Heaviest rainfall, 3.5 inches, occurs during the month of September (Eichmeier 1966).

#### Stream Flow

The source of the Main and North Branch of the Boardman River is the Mahan Swamp in north-central Kalkaska County, 38 miles northeast of Traverse City, Michigan. From the Mahan Swamp headwaters, the river flows southwesterly 40 miles through forested land to the Brown Bridge Pond. At this point, the river turns northerly for nine miles flowing through several other impoundments before emptying into the West Arm of Grand Traverse Bay at Traverse City.

The Boardman River is the largest tributary to the West Arm of the Grand Traverse Bay. The Boardman River Watershed (Figure 3) drains 188,800 acres of land and includes 130 miles of river and stream tributaries.

Stream flow in the Boardman River is fairly stable, especially during low flow periods, as it is sustained by ground water discharging to the river from the permeable upland glacial soils. United States Geological Survey (USGS) records show an average daily discharge of 197 cubic feet per second at Mayfield. An average minimum flow for the summer months is about 130 cubic feet second. Spring flows normally raise the stage heights from two to four feet in the upper and lower reaches, respectively.

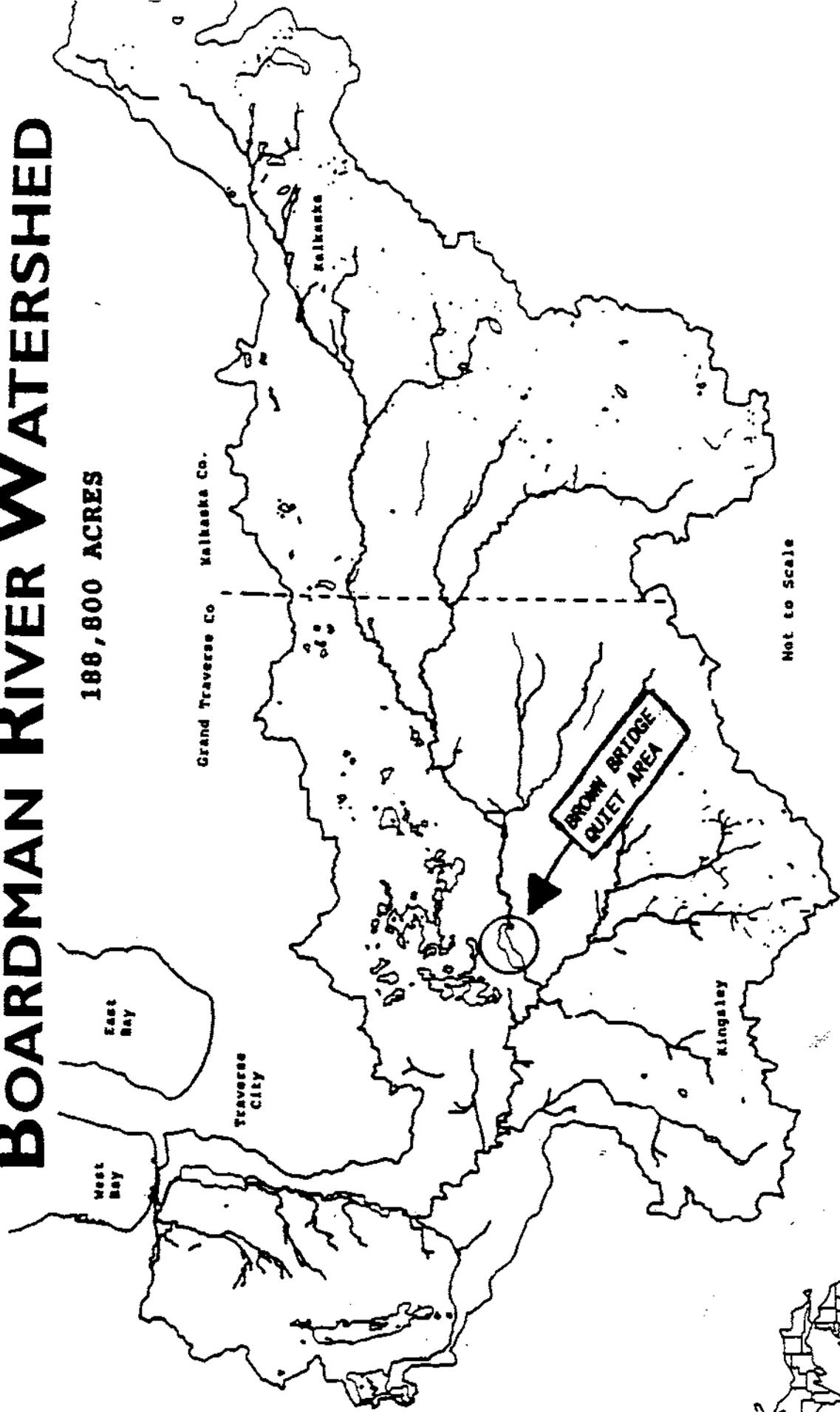
The Boardman River has a moderately fast stream gradient for a Midwest stream, dropping 510 feet in elevation from its source northeast of Kalkaska to the West Arm of Grand Traverse Bay. Although five dams from Kalkaska to Boardman Lake dissipate about 110 feet of fall, the average drop in elevation over these 50 miles of stream is eight feet per mile.

#### Reservoir & Dam Description

The Brown Bridge Reservoir, also know as Brown Bridge Pond, is a 191-acre \* impoundment created when the 2,400 foot earthen dam was built in the early 1920's. The headwater elevation is 797.5 feet above the

# BOARDMAN RIVER WATERSHED

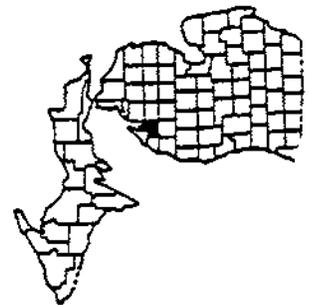
188,800 ACRES



Not to Scale

Figure 3

The Brown Bridge Quiet Area is located in the heart of the Boardman River Valley. (East Bay Township, Grand Traverse County)



U.S.G.S. mean sea level (T.C. L&P 1980). The reservoir has an average head of 30.2 feet and a mean outlet flow of 161 cubic-feet per second (cfs).

Two turbines are presently in operation at Brown Bridge. The oldest turbine is a Luffel Type Z, installed in 1921 and is rated at 690 h.p. at a flow of 252 cfs. (Henry Ford helped Bill Love of City L&P acquire this turbine). The second turbine is a Luffel Type F, rated at 375 h.p. at a flow of 135 cfs and was installed in 1941.

The dam operates in a "run-of-the-river" mode, which means the cfs out-put from the dam, should equal the cfs in-put from the river. In 1989, City L&P installed a new state-of-the-art System Control And Data Acquisition (SCADA) Center for all three of their dams in operation (Brown Bridge, Sabin & Boardman). This system allows City Light & Power precise control over the floodgates from a single control station located at the Power Plant off Grandview Parkway. All three of the City Light & Power dams are licensed under the Federal Energy Regulatory Commission (FERC) through year 2014.

(\* Documented reservoir size varies from 180 acres to 191 acres depending on the amount of river and emergent marsh that's considered reservoir.)

#### Soils

The soils at Brown Bridge range from a Tawas-Roscommon complex, to Rubicon sands, to Crosswell and Kalkaska loamy sands, to Kerston and Lupton Mucks (Appendix "A"). The upland areas have loams and generally well-drained sands on level to moderately rolling slopes. The south-facing north bank exhibits a sharp drop off from the upland area to the river valley below. The soils in this area are rubicon sands on 25 to 45 percent slopes and are highly erodible. The mucks in the lowland areas are poorly drained.

#### Flora

Reese (1992) used interpretation of aerial photography from 1938, 1951, 1979, 1987 and 1989 and extensive field investigations to determine the boundaries of plant and natural communities at Brown Bridge. During the growing season he compiled a master checklist for the flora in both the upland and wetland habitats. He found that the wetland flora includes 162 identified taxa of which 154 are native. The remaining eight taxa are exotic species. The average coefficient of conservatism of these species is 4.41 with a community quality index rating of 56.10. He writes: "While comparative ratings have yet to be widely determined in Michigan, this rating is sufficient for consideration of the area as a significant botanical refugia" for native species. Reese also reports that Wilhelm & Ladd (1986) concluded, based on comprehensive surveys of natural areas in the lower Lake Michigan watershed, that:

"...the vast majority of land in the region ranks less than 20 and is of essentially no significance from a natural area perspective. Areas ranking above 35 possess sufficient conservatism and richness

to be of profound importance from a regional perspective. Areas rating in the 50's and above are extremely rare and of paramount importance; they represent less than 0.02 percent of the land area in the Chicago region."

(\* The Chicago region consists of several counties located around Lake Michigan in the states of Illinois, Michigan, and Wisconsin.)

Separate floristics checklists for the uplands and the wetlands at Brown Bridge can be found in Appendix "B". The upland flora checklist is based on limited reconnaissance and is incomplete.

#### Community (Habitat) Types

Reese (1992) identified nine natural community and four artificial (human disturbance) community types that characterize the Brown Bridge Quiet Area (Figure \*\*\*). One additional artificial community type, a red-pine plantation, occurs on the property that the City is attempting to acquire.

#### Natural Community Types

1. Emergent Marsh
2. Northern Wet Meadow
3. Northern Shrub Thicket
4. Rich Conifer Swamp
5. Poor Conifer Swamp
6. Hardwood-Conifer Swamp
7. Hardwood-Conifer Swamp
8. Dry-mesic Northern Forest
9. Dry Northern Forest

#### Artificial Community TYPES

1. Brown Bridge Reservoir
2. Oil well pads and
3. Brown Bridge Dam
4. Lawns and old agricul.
5. Red-pine plantation
6. Old Logging roads & two-tracks
7. Log rollway

The following is a synopsis of each Natural Community occurring at Brown Bridge abstracted from Reese's (1992) report. Appendix "B" contains a complete flora species list including scientific names.

#### EMERGENT MARSH

Emergent marshes are herbaceous vegetation dominated natural communities on muck soils. At Brown Bridge there are two locations for these communities. Both are adjacent to lakes.

The larger of the two locations is on the south side of Brown Bridge Pond. This site is co-dominated by a sedge (Carex oligosperma) and common cattail. It is a degraded community with an unstable, floating organic mat. The mat rises and falls with changes in the water level of Brown Bridge Pond.

A higher natural quality Emergent Marsh occurs in the northwestern part of the Quiet Area. It is adjacent to a small lake with a

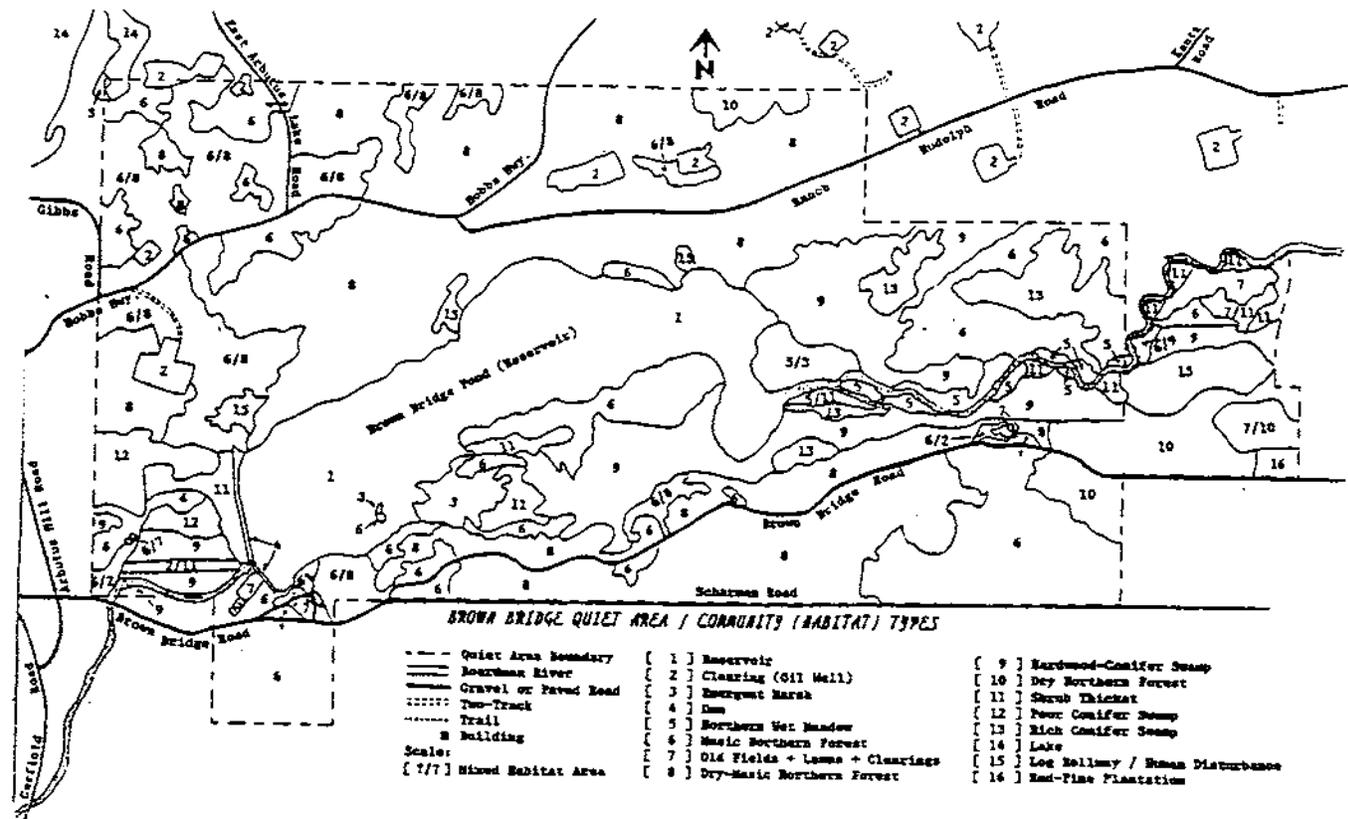


Figure 4

COMMUNITY TYPES - Brown Bridge is characterized by 9 natural and 7 artificial Community Types.

The Brown Bridge Quiet Area is considered a "significant botanical refugia for native plant species".

NOTE: This map was revised from Gary Reese's (1992) map by Rick Courtemanche a state prison inmate working at Brown Bridge. Since 1988, when the City of Traverse City first utilized state prison inmate labor, several inmates, like Mr. Courtemanche, have discovered hidden talents and learned new skills that were otherwise suppressed by drugs or street life. These new found skills will help them better adjust to society in a productive manner once released from prison.

This illustrates a valuable side-benefit of the City's Brown Bridge project and is a tribute to Bob Snyder, Work Crew Supervisor, Michigan Department of Corrections, for his patience and leadership.

natural hydrological regime. Narrow-leaved cattail dominates this community.

#### NORTHERN WET MEADOW

Northern Wet Meadows occur along the Boardman River. They occupy Kerston muck soils on the first terraces adjacent to the river. Frequent natural disturbances such as flooding retard succession to forest, leaving a dominance by herbaceous plants. These are predominantly sedges and grasses, which form characteristic hummocks. Further from the river, this community type gives way to both Northern Shrub Thickets and Rich Conifer Swamps.

Important plants of Northern Wet Meadows within the Brown Bridge Quiet Area include: yellow sedge, three-seed sedge, swamp thistle, bedstraw, wire-stem muhly.

#### MESIC NORTHERN FOREST

Mesic Northern Forests occupy sandy and sandy loam soils such as Crosswell and Rubicon. Where these forests occur on the outwash plain, they are generally Rubicon sands. When they occur in the outwash channel, they are primarily Crosswell. These forests are dominated by a wide variety of trees, reflecting the variety of disturbances that have taken place over the last 140 years. These dominants include balsam fir, white pine, red pine, red maple, sugar maple, Northern red oak, quaking aspen, white ash, hemlock, paper birch, and beech.

Other important species of this community type within the Brown Bridge Quiet Area include: Pennsylvania sedge, Poverty grass, wood horsetail, American honeysuckle, staghorn clubmoss, wild lily-of-the-valley, rice-grass, wood betony, Kentucky bluegrass, choke cherry, bracken fern, twisted-stalk, American starflower, and lowbush blueberry.

#### DRY-MESIC NORTHERN FOREST

Dry-Mesic Northern Forests are found on Rubicon and Kalkaska soils on outwash plains. They are dominated in the forest canopy by both hardwood deciduous and softwood coniferous trees. These include: quaking aspen, red pine, black oak, and white oak. The subcanopy is dominated by basam fir, white pine, red maple, serviceberry, and sugar maple. The shrub layer is dominated by choke cherry, hornbeam, black huckleberry, and lowbush blueberry. The ground layer is dominated by bracken fern, Pennsylvania sedge, and aster.

Other important species of this community type within the Brown Bridge Quiet Area include bent grass, wild lily-of-the-valley, rice-grass, false spikenard and twisted-stalk.

#### HARDWOOD-CONIFER SWAMP

Hardwood-Conifer Swamps occupy the outwash channel both north and south of the Boardman River. They are associated with Tawas muck and Roscommon sand. The forest canopy is dominated by Arbor vitae, paper

birch, red maple, black ash, white pine, hemlock, and black spruce. The subcanopy is dominated by balsam fir. When present, the shrub layer is dominated by speckled alder, and dwarf raspberry. The groundlayer is dominated by peat moss, cinnamon fern, woodfern, naked Bishop's cap, field horsetail, marsh horsetail, moss, and sedge.

Other important species of this community type within the Brown Bridge Quiet Area include swamp milkweed, lady fern, blue-joint reedgrass, bladder sedge, downy willow-herb, wood horsetail, sweet-scented bedstraw, oak fern, Northern bugleweed, wild lily-of-the-valley, two-flowered Bishop's-cap, quaking aspen, Heal-all, braken fern, and wrinkled goldenrod.

#### DRY NORTHERN FOREST

Dry Northern Forests are found on Kalkaska soils on outwash plains. They are limited in acreage within the Brown Bridge Quiet Area. This natural community type is dominated in the forest canopy by jack pine, white oak, and red pine. The subcanopy is dominated by white pine, white oak and black oak. The shrub layer is dominated by blueberry, and lowbush blueberry. The groundlayer is dominated by braken fern and Pennsylvania sedge.

#### NORTHERN SHRUB THICKET

Northern Shrub Thickets are found on Kerston mucks adjacent to the Boardman River. Trees are sparse within the thickets and are primarily represented by paper birch, and arbor vitae. The shrub layer is well developed and dominated by speckled alder and willow. The groundlayer is dominated by sedge. Other important species include swamp thistle.

#### POOR CONIFER SWAMP

Poor Conifer Swamps are found on Lupton muck. They are of limited extent within the Brown Bridge Quiet Area. The forest canopy is dominated by black spruce, tamarack and white pine. There are no subcanopy or shrub layer dominants. The groundlayer is dominated by peat moss, hybrid cattail, and narrow-leaf cattail.

#### RICH CONIFER SWAMP

Rich Conifer Swamps are located on Lupton muck in the outwash channel occupied by the Boardman River. The forest canopy is dominated by arbor vitae, balsam fir, and black spruce. Groundlayer dominants are similar to those for Hardwood-Conifer Swamps.

#### Wildlife

Six known animal species of endangered, threatened, or special concern status have been documented within Grand Traverse County. Presently five of these species occur at the Brown Bridge Quiet Area. They include: Bald eagles, Osprey, Red shouldered hawks, Common loon, and Wood turtles.

Many other species of non-game birds and small mammals are also dependent upon the property exclusively for their existence or use it on occasion for the food and shelter it offers. These include:

Great blue herons, Pileated woodpeckers, Deer, Black bear, Bobcat, Coyote, Red fox, River otter, Beaver, and Mink. Appendix \*\*\* contains a more complete list of the wildlife species, including scientific names, that occur at Brown Bridge.

The integration of the human dimensions into wildlife management has been lacking until recent years. Aldo Leopold, considered the "father of wildlife management", established the foundation for the development of the field of wildlife management with his landmark book Game Management. Leopold's (1933) definition of "game" management was a simple straight forward reflection of the time: "Game management is the art of making land produce sustained annual crops of wild game for recreational use." Three words within the definition---game, crop, and use, indicate the utilitarian philosophy underlying the practice of wildlife management for about the next 40 years (Decker et al. 1988).

Although wildlife management is aimed at achieving human goals, the human element was largely ignored until recent years (Burger 1979). Past management efforts were directed almost entirely at game species. This holds true even today.

Deer are the primary management objective of the MDNR on State land because of the revenue associated with hunting. But within State "special management areas" (i.e. wildlife: preserves, refuges and sanctuaries) and on non-State land, contemporary wildlife management has a framework much more complex than the simple game and crop components originally offered by Leopold.

Giles (1978) identified the 3 major elements of contemporary wildlife management as wildlife populations, habitats and people, where each element is equal and interactive. Whereby the human activities that constitute management (i.e. hunting, trapping, hiking, wildlife viewing, etc..) are viewed as an interactive sub-system, bringing to the forefront the human dimension as a primary consideration in a comprehensive approach to wildlife management.

Simply stated, all values of wildlife must be considered when developing a management plan.

#### Wildlife values

The wildlife manager must realize and address several diverse values of wildlife when producing a management plan. Bailey (1984) offers seven

types of wildlife values:

- 1) Commercial
- 2) Recreational
- 3) Biological
- 4) Scientific, philosophical and educational
- 5) Aesthetic
- 6) Social
- 7) Negative

Bailey (1984) points out that presenting only the emotional case for wildlife neglects some of the commercial and recreational values, while presenting only the cash value of wildlife into the local economy ignores the fact that wildlife enhances the quality of human life. The management guidelines set forth in this document consider all values of wildlife within a context of economic feasibility. Appendix \*\*\* contains a brief description of each value listed above.

### Fisheries

Sportsmen who have been fishing Brown Bridge Pond for years have noted a decrease in brown trout populations. Some have suggested that the population decline has coincided with the declaration in the early 70's by the MDNR, that the Brown Bridge Pond is a "non-trout water". (All four reservoirs on the main portion of the Boardman River are classified by the MDNR as "non-trout waters".)

As a result of this classification, brown trout may be caught year-round at brown bridge. Some sportsmen feel that this has had a significant impact on brown trout populations in both the reservoir and the river. A local resident reported that one group of ice-fishermen caught 120 brown trout through the ice one winter shortly after the deregulation.

In response, Ralph Hay, MDNR Fisheries Biologist, was contacted about the possibility of having Brown Bridge Pond declared "trout waters" again. He stated that you have to look at all the impoundments on the river system, not just Brown Bridge to have them classified as "trout waters". (A MDNR Commission Order is possible to regulate winter fishing for trout..see Fisheries / Reservoir Management for details.)

For the MDNR to designate a body of water as "trout waters" you need one of three criteria:

- 1) Trout are the dominant fish species.
- 2) Suitable trout habitat exists, but significant trout populations do not.
- 3) Anadromous fish have access.

The Brown Bridge Reservoir best falls under #2; suitable trout habitat exists, but significant trout populations do not. In a 1986 study of the reservoir, MDNR biologists collected seven brown trout, but they are not the dominant fish species (figure 5). (The hydro-impoundments on the river do not contain fish ladders, so anadromous fish have no chance of reaching Brown Bridge.)

If suitable habitat exists and brown trout are present, why does it appear that their populations are in decline at Brown Bridge? Several factors, including apparent pike and bass dominance, loss of habitat and year-around ice fishing for brown trout, contribute to this problem.

First, pike are voracious predators that do considerable damage to trout populations. Twenty-nine pike were netted in the 1986 survey (figure 5).

They averaged 18.5 inches in length and were reported to be growing very slow compared to the state average. Pike of this size are called "hammer handles" and may severely limit other populations of fish including brown trout. To that end, the City should investigate all management possibilities with MDNR Fisheries Division.

Second, the east end of the reservoir is rapidly filling up with sand. A recent erosion inventory revealed over 600 erosion sites throughout the Boardman River watershed (Largent 1991). Eighty five percent of these sites are the result of human activity. As sand is moved down stream by the river's current it settles out when it reaches the slower waters of the reservoir.

Over the years, sand has filled in the deep holes that once harbored brown trout. According to Bob Snyder, who fished the east end of the reservoir twenty five years ago as a boy, "it was not uncommon to catch several nice size trout in a day" in a area of pond that is now only a couple feet deep.

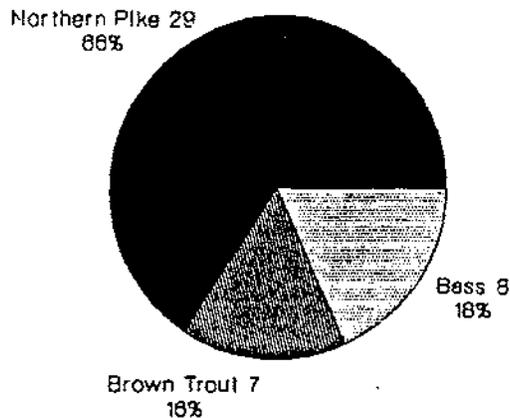
Other factors include reduced trout populations in the river above Brown Bridge 9 (due to the sand), and increased fishing pressure on both the river and the reservoir.

There has also been a notable increase in aquatic plant growth within the reservoir. This increased growth, to a large extent, is due to the human activity that has augmented the supply of nutrients to the reservoir in the form the sand sediment. Dense stands of aquatic plant growth alters the immediate environmental conditions in comparison to those of the open water. Not only is the amount of open water habitat available to fish reduced, but the amount of light that penetrates into Phytoplankton are a primary producer in an aquatic system and an important part of the food chain.

To summarize, three factors are combining to limit the quality of fishing at Brown Bridge. They include:

1. Winter fishing for brown trout.
2. The high abundance of pike in the reservoir.
3. Loss of habitat.

# BROWN BRIDGE RESERVOIR GAME FISH SURVEY



1986 MDNR SURVEY - see Appendix "E"

Figure 5

## Experimental Planting Area

To find a potential alternative to the well-liked, non-native shrub, autum olive, four experimental SCS plots were planted in abandoned well sites at Brown Bridge. Autum olive is an exotic shrub species that and has been hailed by MDNR and other land managers as the perfect answer to many erosion control problems because it grows in a variety of conditions including severely eroded land. In addition, it produces berries that are highly desired by birds and other wildlife.

The problem is that autum olive, in many cases, spreads uncontrollably choking-out native vegetation, ultimately overtaking vast quantities of forests. After the shrub becomes established eradication is difficult at best.

Besides potentially finding an alternative to autum olive, the experiment, designed by Tom Adams, SCS, Bob Snyder, MDOC, and myself, will serve two additional objectives.

First the shrub plantings will revegetate abandoned oil well sites at Brown Bridge where original reclamation plantings of grass and rye by the oil companies did not survive. Second the circular-clump design will provide high quality wildlife habitat in future years.

Each clump consists of six rows of circular plantings. The first two rows are planted in white or red pine. The pine will potentially provide a thick core-area for the wildlife. The next two rows (rows 3 & 4) are planted with one of eight native shrubs that will provide the wildlife a source of food. The shrubs in one of these rows are planted in compost (leaf mulch), the other row of shrubs are planted

in the sandy conditions found on-site. The purpose of this element of the experiment is to determine the extent that compost encourages survival as opposed to planting in just sand. The next two rows (5 & 6) are planted in the same manner as the previous two rows, only using a different type shrub.

The eight species of shrub used in this experiment are native to Michigan and provide some type wildlife berry. They include: nannyberry, red-osier dogwood, highbush cranberry, wildgrape, black cherry, american bittersweet, service berry, and sand cherry.

Appendix "F" contains drawings of each clump including the clump location, spacing of each row, the species of shrub planted in that row and percent survival 60 days after planting..

#### Oil & Gas Wells

On April 4, 1977 the citizens of Traverse City approved a ballot proposal to allow drilling for oil and gas on the Brown Bridge property. The city did drill and strike oil. To date (2002), the gas and oil revenue from the city-owned wells (five wells initially and two producing wells currently), Brown Bridge has placed approximately eight million dollars into the Brown Bridge Trust Fund. Annually, the trust fund generates close to a half million dollars (over 2.5 mills) in interest revenue; the revenue is then placed into the General Fund to offset taxes and fund city-wide operations.

The Niagaran reef formation, which developed approximately 450 million years ago during the Silurian Age, provides the reservoir for all oil and gas wells in northwest Michigan. Geologists claim that only 25% of the oil within these reefs can be recovered, the other 75% remains forever. The gas and oil wells throughout this trend are all approximately 6,0000 feet in depth.

Wells are shut down when production has declined to the point where it is no longer economically feasible to operate. The current price per barrel of oil and amount of water extracted with the gas determines the economy of the operation.

Between December 22 1983, Traverse Oil drilled a dry-hole on the current Petro-Star site. After that initial setback, five successful wells were drilled on City property. A sixth well on City property (State East Bay 2-14A) the State of Michigan owns the mineral rights.

The following is a short synopsis of how each of the five wells with city-owned mineral rights, are producing.

East Bay 1-15C, located off Hobbs Highway and across from Gibbs Road was originally drilled in 1987. The well was re-drilled in 1988, and is now owned by Ward M. Haggard Oil and Gas Exploration Inc. Attempts to produce the well recently were unsuccessful. A downhole pump was replaced and the well has been pumped intermittently to determine well capabilities in preparation for petitioning the Supervisor of Wells of the State of Michigan for authority to inject water into the

Niagaran Reef formation in this well to increase the rate of production and the ultimate cumulative production from this reef. It is anticipated that once authority to inject water is obtained, the well will be treated to increase productivity and the downhole equipment will be modified to facilitate a water injection operation downhole into the Niagaran formation.

Brown Bridge 1-15A and 2-15A, are located at a shared site on Ranch Rudolf Road across from the West Parking Area and are currently owned by Northern Processors Inc. In 1998 Northern Processors was granted permission to re-drill the original well at site 2-15A. The well was directionally drilled to a point in the drilling unit on the edge of the reef and from this point was horizontally drilled. This procedure maximized the amount of reef section penetrated and also allowed the production section of the well bore to be horizontal in the "oil leg" of the reef. This minimized gas production while maximizing both daily oil production and oil recovery volumes. Well site 1-15A replaced the original well 1-15. Both wells produce approximately 25 barrels of crude oil a day. Well 2-15A produces 290,000 cubic feet of natural gas per day, while well 1-15 produces 4350,000 cubic feet of natural gas per day.

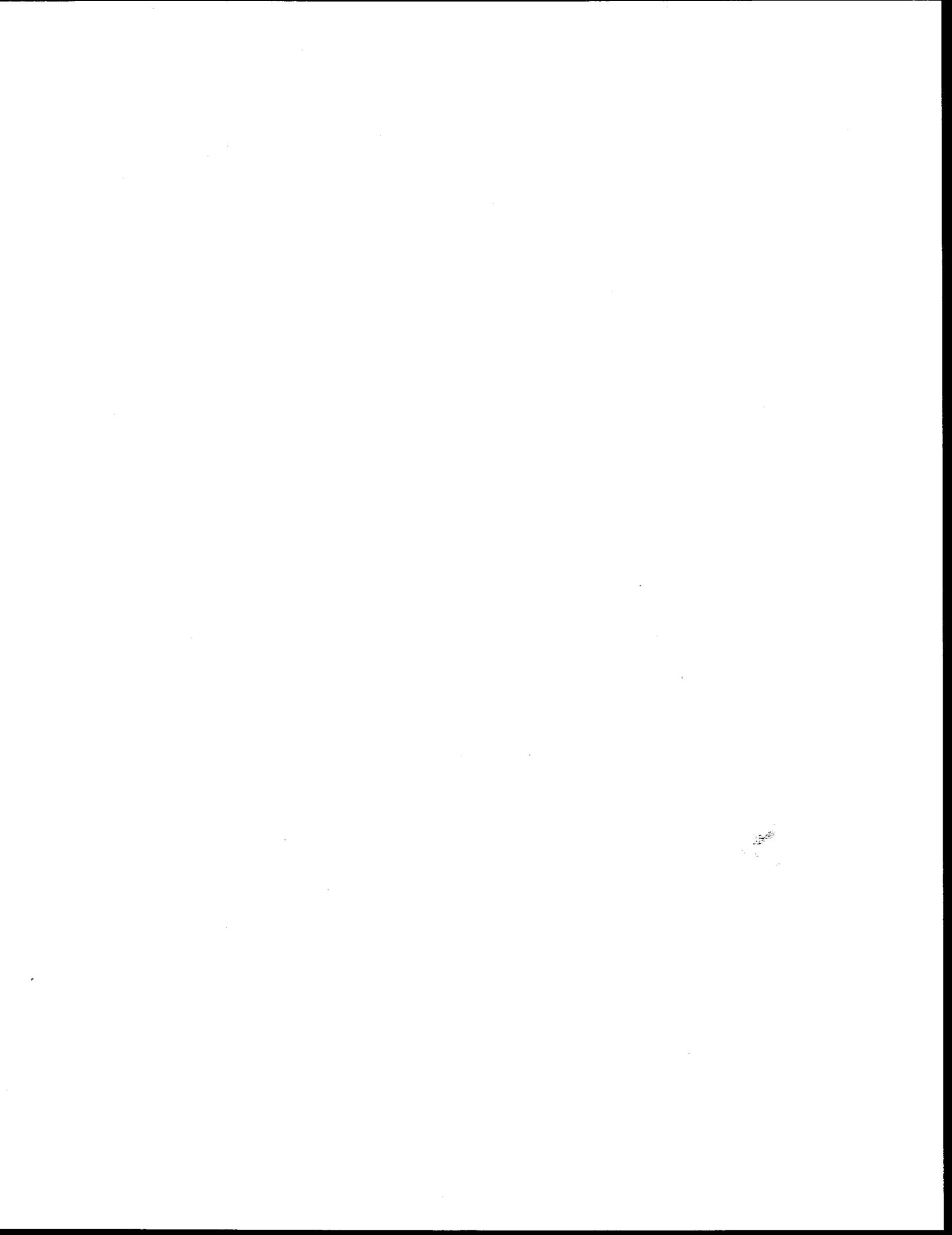
Brown Bridge (State East Bay) 1-14 and 2-14A wells are located on Ranch Rudolf Road east of the East Parking Area. The wells are currently owned by Ominex Energy Inc. Well site 1-14 is no longer in production and has been capped off. Well site 2-14A produces 25 barrels of oil and 400,000 cubic feet of gas daily.

#### Ground Water Contamination & Bio Clean-up

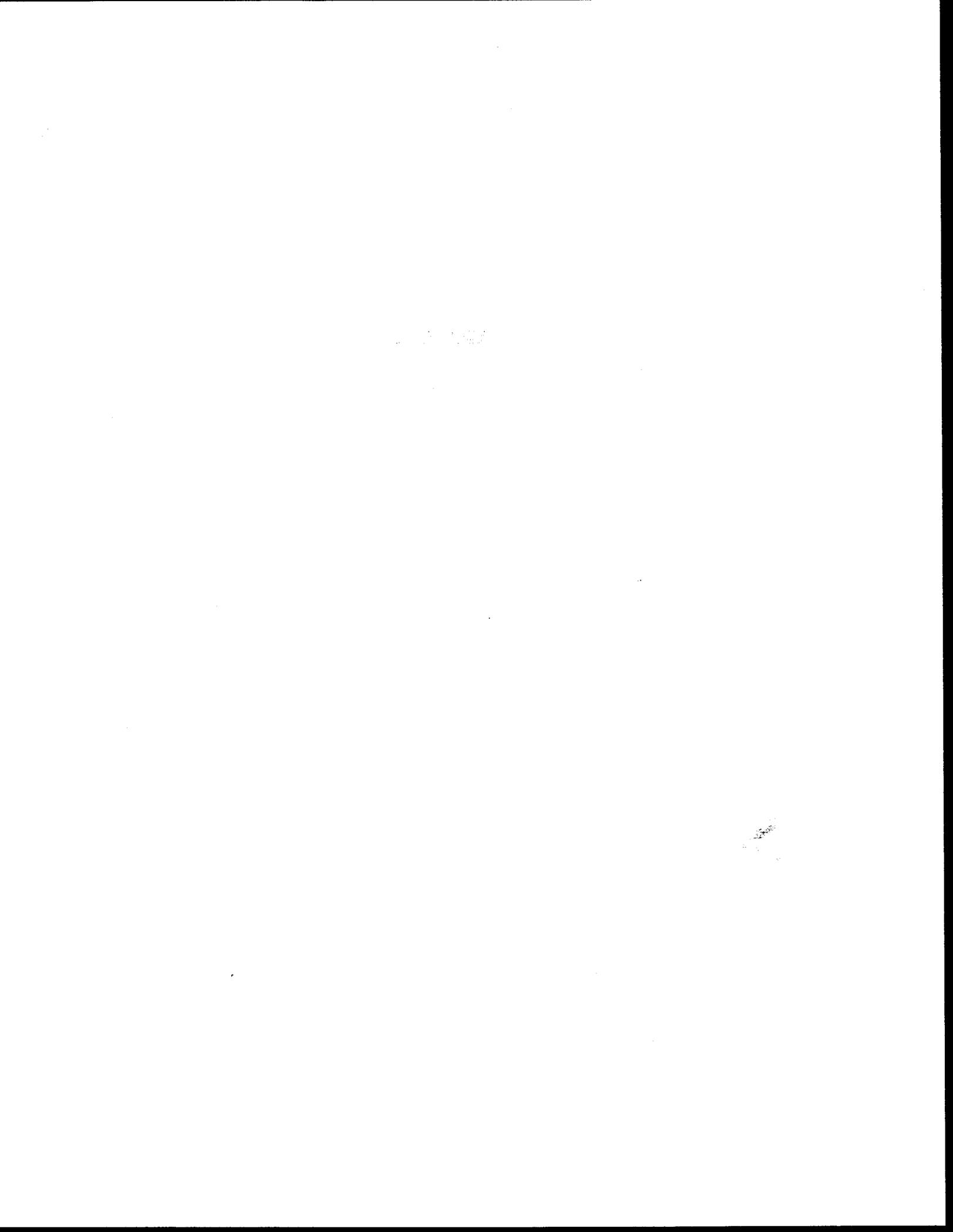
Water contaminated with hydrocarbons leaked for approximately four years from the State East Bay 2-14A facility, located on City property. The contaminated water eventually reached the groundwater below, polluting it as well.

In 1988, Conoco, aware of the contamination problem, purchased the facility from Total Petroleum. Conoco worked engineers to formulate a remediation plan. A pinnacle of clay that varies in depth and thickness has complicated clean-up efforts. The impermeable clay layers cause the (contaminated) ground water to flow in several different directions. Originally 39 monitor wells, six purge wells, and five nutrient injection wells have been drilled. This system has cleaned up most of the hydrocarbons in the ground water. The wells were purchased by Ominex Energy Inc. and in 2000/2001 installed a Soil Vapor Extractor (SEV) system to complete the clean-up efforts. Eight new purge wells were drilled to collect hydrocarbon gasses from the aquifer area. A pump draws the gasses to a collection area where they are passed through a catalyst bed to remove the hydrocarbons. This process is expected to be complete by 2003.

Appendix "G" contains location maps of the clean up wells and an abbreviated report prepared by Mr. Richard Raitz, Project Manager, Gosling Czubak & Associates.



SECTION 3



I.

FOREST MANAGEMENT

As noted in Reese's report, the upland flora checklist is based on a limited reconnaissance and is incomplete. The City of Traverse City should investigate ways to complete the flora inventory of the upland areas at Brown Bridge.

A. Community Type Management

Nine natural community and seven artificial (human disturbance) community types characterize the Brown Bridge Quiet Area (Figure 4).

1. Natural Communities:

a. Emergent Marsh -- Manage for wildlife. Discourage human activity, including boats and hunting blinds within this community type unless for management reasons.

A high natural quality emergent marsh (Reese 1992) that occurs adjacent to Perch Lake, should be monitored and protected. If trails are developed in this portion of the Quiet Area, protective and interpretive signs should be placed.

b. Northern Wet Meadow -- Manage for wildlife. Discourage human activity, including hunting blinds within this community type unless for management reasons. Soils in these areas are almost always mucks; hydrology should not be altered in anyway.

c. Northern Shrub Thicket -- Manage for wildlife and limited hiking. This community type is found on Kerston mucks adjacent to the Boardman River. Currently portions of hiking trails traverse this community type utilizing boardwalk structures and foot-bridges in the ponded areas. Further trail development through this community type should not necessarily be avoided, but rather, wisely planned and engineered. MDNR wetland permit required.

d. Rich Conifer Swamp -- Manage for wildlife and limited hiking. This community type is located on Lupton mucks in the outwash channel occupied by the Boardman River (Reese 1992). Currently portions of hiking trails traverse this community type utilizing boardwalk structures and foot-bridges in the ponded areas. Further trail development through this community type should not necessarily be avoided, but rather, wisely planned and engineered. MDNR wetland permit required.

e. Poor Conifer Swamp -- Manage for wildlife. This community type is found on Lupton mucks and is of limited extent at Brown Bridge. Trail development should be avoided in these areas.

f. Hardwood-Conifer Swamp -- Manage for wildlife and limited hiking. This community type is associated with Tawas muck and Roscommon sand. Both possess severe limitations for recreational uses due to ponding (Reese 1992). Currently portions of hiking trails traverse this community type utilizing boardwalk structures and foot-bridges in the ponded areas. Further trail development through this community type should not necessarily be avoided (unless for wildlife management reasons), but rather, wisely planned and engineered. MDNR wetland permit required.

g. Mesic Northern Forest -- Manage for hiking and wildlife. When trail development encounters slope or soil limitations, all alternatives should be considered by the Advisory Committee before continuing with such development.

h. Dry-mesic Northern Forest -- Manage for hiking and wildlife. When trail development encounters slope or soil limitations, all alternatives should be considered by the Advisory Committee before continuing with such development.

i. Dry Northern Forest -- Manage for hiking and wildlife. Limited acreage of this community type occur at Brown Bridge. When trail development encounters slope or soil limitations, all alternatives should be considered by the Advisory Committee before continuing with such development.

## 2. Artificial Communities:

a. Brown Bridge Reservoir -- See FISHERIES / RESERVOIR MANAGEMENT for management recommendations.

b. Oil well pads and clearings -- Manage for wildlife. Revegetate abandoned well sites utilizing SCS circular clump planting design (Appendix "F"). If circular clump planting is not possible, then transplant larger trees into the clearing from the surrounding forest environment.

Maintain interspersed forest openings of 1-5 acres and irregular forest edges as described in the Forest Openings and Edges section. Revegetate such openings with native grasses and legumes.

c. Brown Bridge Dam -- City Light & Power is responsible for maintaining the 2,400 lineal foot earth embankment and dam. All work on the dam must be coordinated with Light & Power officials.

Closely monitor the impacts of human foot traffic on the berm. If problems arise, additional steps, a boardwalk or wooden fishing structures may be needed along the embankment.

Work with Light & Power officials to plant native fruit bearing shrubs around as much of the embankment as possible to "soften" its appearance.

Work with Light & Power officials to alleviate yearly wood chuck and beaver problems in a way consistent with Quiet Area policy.

d. Lawns and old agriculture -- Lawns should be eliminated where possible. The caretakers residence and a small area around the interpretive displays should be the only areas where lawns are maintained.

Manage old agricultural openings for hiking and wildlife as described in the Forest Openings and Edges section.

e. Red pine plantation -- Manage community type for cabin logs (possibly for a future nature center). To accomplish this, thin every third row of trees. This will maintain enough density to result in self-pruning of the trees due to the lack of sunlight on the lower branches. This will yield taller straighter trees as a result of competition. Be careful not to thin too much. Thinning too heavily may result in shorter, more heavily limbed trees that yield a lower volume of saw logs.

Thinning is best accomplished during the late summer or fall to avoid pine-bark beetle outbreaks. Pine-bark beetles are most active during the spring and may cause severe mortality in the entire stand. After harvest, remove all debris two inches in diameter or larger. This will help reduce the chances of a beetle outbreak.

f. Old Logging Roads & Two-Tracks -- Manage as hiking trails or revegetate to forest. Continue to block unnecessary interior roads with hardwood posts and revegetate.

All efforts should be made to close Brown Bridge Road to vehicular traffic. See Brown Bridge Road section for additional recommendations.

g. Log Rollway -- Crib & revegetate utilizing native shrubs. Cover the area with composted leaf mulch to increase soil fertility.

## B. Forest Openings and Edges

Brown Bridge is limited in natural forest openings. Forest openings are upland areas of one-half to 10 acres in size. They are important because they generally provide forage grasses and legumes that are grazed on by deer. Forest openings also are utilized by predatory mammals and birds hunting for the small mammals that live within this community type. One hundred and fifty eight (158) species of wildlife in northern forests use openings for the food and/or the shelter it offers sometime in their life.

Brown Bridge should be managed so that at least 5% of the upland is maintained as forest openings. These may include abandoned well sites after reclamation. Red pine and white pine thickets located on the south-side uplands could be thinned to create a percentage of the desired openings. Wildlife openings should have a 3:1 ratio of length to width (Henderson 1986). The width should be twice as high as the adjacent trees. Seeding and maintenance of these areas is essential.

Edges between forest habitat types is where wildlife tend to be more abundant. The edges provide animals with simultaneous access to two or more habitats.

The forest edge should have irregular, not straight, edges. Abandoned well sites, if managed as forest openings, should be re-cut to achieve the proper width to length ratio. When cutting along the edge to create openings, tall snags, den trees, and valuable wildlife shrubs should be saved. If wildlife shrubbery is not present along the forest edge some should be planted.

## C. Timber Harvesting

Timber harvesting for monetary gain by the City of Traverse City is not recommended. If harvesting is desired to provide wood products for any use on the property (erosion cribs, interpretive display or center, etc.), it should only occur at the strict discretion of the Advisory Committee. Figure 6 indicates the portion of the Quiet Area that harvesting for wood products to be used on the property will least impact current or planned uses. A small red pine plantation on the property the City is attempting to acquire is the only exception to this recommendation (see Red pine plantation)

The means of harvesting employed should be one that causes the least impact to the land.

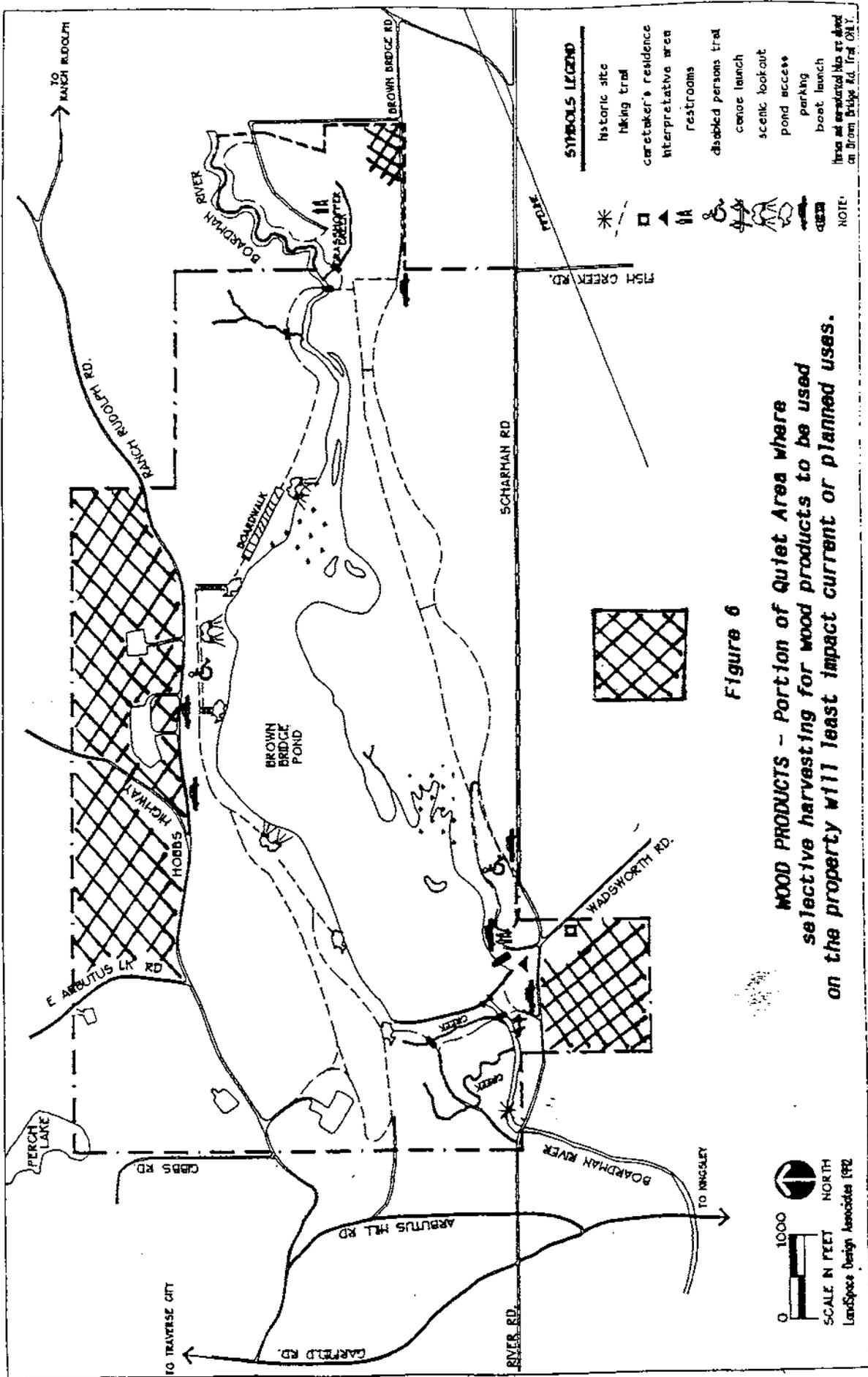


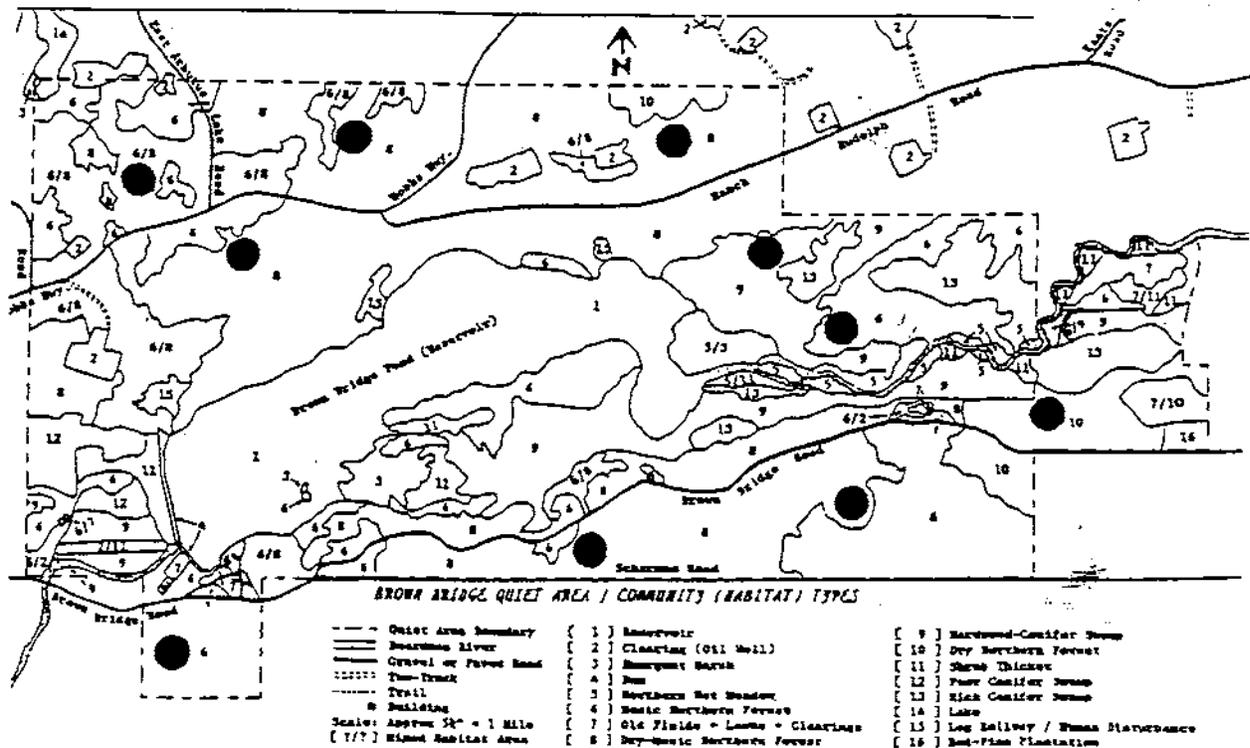
Figure 6

#### D. Aspen Management

Aspen forest types are vital to the survival of ruffed grouse, woodcock, and snowshoe hare. Deer, bear, turkey and some songbirds also use this forest type on occasion for their survival. For years grouse populations have been on a constant decline in Michigan. The buds and flowering catkins of male quaking aspen are extremely important grouse foods (Henderson 1982).

During a walk-through visit at Brown Bridge with Rick Moore, District Forester, GTCD, several pockets of mature aspen stands were noticed, but no young aspen shots. He commented that Brown Bridge might lose the aspen component if clearings are not created and aspen regenerated. He suggested that the City develop a cutting rotation to regenerate young aspen forest types.

A forty-year cutting rotation involving five-acre blocks will provide optimum habitat for grouse as well as provide food and shelter for other species of wildlife (Figure 7). As with wildlife openings, the edge of the cut should be irregular and have a 3:1 ratio of length to width. The length of the cut should lay north and south to facilitate sunlight reaching the cut area. Cuts such as this will intersperse the edge effect.



REVISED FROM GARY REESE'S MAP BY RICK COURTENAY FOR BROWN BRIDGE QUIET AREA - AUGUST 1982

Figure 7

Aspen Management – A forty-year cutting rotation involving 5-acre blocks will provide optimum habitat for grouse as well as provide food and shelter for other Species of wildlife.

## **E. Insect Control**

Since the first infestation in 1991 Gypsy moth infestations have subsided due to aerial spraying of a naturally occurring bacterial disease called Bacillus thuringiensis (BT), which only becomes active inside the caterpillar's stomach. BT is applied during the caterpillar stage and is considered 60-70 percent effective. An important side effect of this spray that must be considered before its use is that it kills all lepidoptera, this includes all butterfly and moth caterpillars that may be out at the same time.

The most effective natural control may be found within the caterpillar itself. Dr. Duke Elsner, Michigan State Cooperative Extension Agent, states that every moth carries a dormant virus that becomes activated when the caterpillar is stressed by lack of food, crowding, and/or cold weather. If enough mature caterpillars die as a result of the virus, the problem may not be nearly as serious the following year. He feels that spraying may delay or prohibit this natural cycle.

He makes an important point in that we're dealing with a "constant reintroduction from other areas". With that in mind, spraying may have to be repeated on an annual or semi-annual basis.

## F. Non-native (Exotic) Plant Control

As previously mentioned, according to Reese (1992), the Brown Bridge Quiet Area is a "significant refugia for native (plant) species". He points out that exotic plant species often out-compete native plant species, expanding into adjacent non-disturbed habitats, potentially reducing the viability of the native plants.

### 1. Lowland & Wetland Management:

Reese reports that the "core wetland natural area" at Brown Bridge is mostly free of exotic plants though he identified six exotic plant species including: Charlock, Water-cress, Timothy, Common plantain, Self-heal, Black nightshade, Common dandelion, and Narrow-leaf cattail.

Of these, Narrow-leaf cattail forms large colonies in areas where, according to Reese, fluctuating water levels result in repeated disturbance of the organic soil and control of this species would not be practical.

Purple Loosestrife has not been found to date at Brown Bridge. Purple loosestrife has been described as "nature's own destroyer of wetlands". This erect perennial wetland plant was introduced in the late 1800's from northern Europe. Purple loosestrife is a prolific seed producer (300,000 per stalk) and its seedling tolerates a wide range of soils. Because of this, it threatens native wetland vegetation, often crowding out cattails, sedges and other native wetland species. Many species of wildlife rely heavily on native wetland vegetation for food, nesting and shelter. Purple loosestrife provides none of this to wildlife.

Most exotic plants encountered in the wetland and lowland areas, including Purple loosestrife, can be effectively controlled by pulling individual plants. Near trails and boardwalks are areas where continued exotic plant introduction will occur due to constant human use. Vigilance will be needed in these areas.

### 2. Upland Management:

Some naturalized herbaceous plants in upland areas may be impossible or impractical to completely remove (i.e. Spotted knapweed). Disturbed areas such as roadsides and well sites provide ideal conditions for these stubborn weeds. In addition, certain species such as Norway spruce, which was planted as part of the Municipal Forest, would cause more problems to remove and should be allowed to grow. As these naturalized species or other such species are encountered individual management is advised. Spraying should be avoided unless authorized by the Brown Bridge Advisory Committee. Aggressive control of other "problem" species such as Autumn olive is encouraged.

Autumn olive, native to the Orient, was once thought to be the best thing to plant for wildlife because one plant may produce up to 80 pounds of berries. Wildlife managers liked the shrub because it was easy to introduce and thrives in a variety of conditions.

Now scientists are voicing great concern over the use of the shrub. Once established, Autumn olive may proliferate and crowd out native vegetation, potentially altering naturally occurring habitat.

Several Autumn olive shrubs occur at Brown Bridge. When encountered, these shrubs should be eradicated, roots and all.

### 3. Leaf Mulch:

Since 1989, work crews have used nearly 1,000 cubic-yards of leaf mulch from the city streets to stabilize the eroded areas along the north bank of the reservoir. The soils in this region are Rubicon and Kalkaska Sands which are highly erodible and do not re-establish vegetation very easily after human disturbance.

When restoration efforts first began in 1988, several eroded areas were reseeded using only a grass seed mixture, hay mulch (which also may contain seeds of exotic plant species) and fertilizer. The result was an initial growth followed by a complete die off due to the sandy infertile soils and the harsh dry conditions of the south-facing slope.

It was then suggested by staff that leaf mulch be used to add a fertile organic layer to the eroded areas. The issue of possible introduction of exotic plant species to the area was discussed with district conservationist Tom Adams, SCS. Mr. Adams felt that the amount of time spent controlling the exotic plants introduced into the area was worth the benefits of stabilizing the eroded slopes.

Reese reports that this practice has had little effect on the wetland flora, though it has "greatly" increased the number of exotic plant species found in the upland areas.

It is recommended that the City continue to use the leaf mulch with caution as not to introduce it to wetland areas and aggressive eradication efforts already underway should continue. Furthermore, it is important that personnel are knowledgeable in plant identification to insure that only non-native plants are eradicated.

### G. Demonstration Planting

Additional experimental plots should be planted utilizing other native shrubs such as Chokecherry, American elderberry, and Pincherry. Each year the height and relative condition should be recorded on the back of the plot sheets so comparisons can be made.

Remove non-native plants and discourage encroaching forest edge from experimental sites to ensure plant health and vitality.

Make sure that the Quiet area has sufficient forest openings before establishing demonstration plots.

## II. WILDLIFE MANAGEMENT

### A. Game Species

In an attempt to preserve the integrity of the natural environment at Brown Bridge for future generations, the City of Traverse City along with City Light & Power have spent thousands of dollars to repair damage from past recreational misuse. Wildlife management is part of maintaining that integrity because it produces forms of wealth that are valued by society.

Wild areas, like Brown Bridge, and outdoor experiences add considerably to the diversity of our environments and to the exceptional quality of life we enjoy here in the northland. Wildlife is a part of that diversity and proper wildlife management can enhance their total value to society and the Grand Traverse region. Experiencing wildlife is often the high point of outdoor recreation.

When formulating the management recommendations, the Brown Bridge Advisory Committee kept in mind all the values of wildlife including the consumptive and the non-consumptive values. In addition, the Advisory Committee was cognizant of the safety of the non-hunter (real or perceived) who may utilize the Quiet Area during the hunting season.

Appendix "H" contains species-specific management recommendations for "game" animals at Brown Bridge.

#### 1. Hunting & Trapping:

Appendix "H" contains the specific hunting and non-hunting areas mandated by the City Commission under the counsel of the City Manger and the Brown Bridge Advisory Committee. The Brown Bridge Advisory Committee, under the direction of the hunting and trapping sub-committee, will make future management decisions on a year-to-year basis. The Advisory Committee will inform, by letter, the City Manager and the City Commission when harvest will occur in a "no-hunting or trapping" area for management reasons.

Under the current plan, approximately 40% of the land area will remain open to State regulated hunting and trapping. Forty-three percent (the "core area") will be closed to hunting and trapping. The remaining 17% is covered by water where at present waterfowl hunting is allowed.

## **B. Management of Special Concern Animals**

Seven known animal species of endangered, threatened, or special concern status have been documented within Grand Traverse County. Presently six of these species occur at the Brown Bridge Quiet Area. They include: Bald Eagle, Osprey, Common loon, Red shouldered hawk, Wood Turtle, and Eastern box turtle.

Other species of special concern include: Barred owl, Mute swan, and Trumpeter swan.

Appendix "I" contains a map that shows special management areas for each species.

### **1. Endangered or Threatened Species**

#### **a. Bald eagle**

**Status:** Both a federally and State-listed threatened species. Frequent Brown Bridge, but is not known to nest on property.

**Nesting habitat:** Prefer large white pine, located on river stretches near a sizable body of water, reliable food supply, and isolation from human disturbance.

**Diet:** Fish, waterfowl, other birds, mammals (up to rabbit size), and carrion.

#### **b. Osprey**

**Status:** State threatened species. Frequents Brown Bridge, but not known to nest on property.

**Nesting habitat:** Nests are placed in tall pines, flat-topped hemlocks, or topped spruces or tamaracks, possibly up to several miles from the nearest water body. Human-made nest structures are readily accepted by osprey.

**Diet:** Almost exclusively fish.

#### **c. Common loon**

**Status:** State threatened species. Currently nests at Brown Bridge.

**Nesting habitat:** Lakes greater than 10-acres in size with a reasonable supply of fish, a large proportion of undeveloped shoreline, and freedom from frequent high-speed boating and human intrusion. Nesting usually occurs on a small island or floating bog mat.

**Diet:** A variety of fish up to eight inches long. Less often crayfish, frogs, aquatic insects, and aquatic plants.

d. Red-shouldered hawk

Status: State threatened species. Currently nests at Brown Bridge.

Nesting habitat: Prefer large expanses of mature floodplain and forested wetlands with interspersed marshy openings. Forest stands dominated by beech and maple are most frequently selected as nesting sites; whereas, oak and pine stands are rarely used.

Population decline has been documented continent-wide. Habitat fragmentation has shifted the competitive advantage from re-shouldered hawks to the more common red-tailed hawk (Bryant 1986).

Diet: Frogs, snakes, crayfish, small birds and rodents.

e. Wood turtle

Status: State "species of special concern".  
Currently nests at Brown Bridge.

Nesting habitat: Rivers, streams, swamps, woodland bogs, wet meadows, and open fields are included in its generalized choice of habitats. Nest site must have ample exposure to direct sunlight, free of thick vegetation.

Diet: Plant food includes blueberries, black berries, raspberries, strawberries, leaves, grasses, and algae. Animal food includes; mollusks, insects, earthworms, tadpoles, dead fish, and newborn mice (Reece 1992).

f. Eastern box turtle

Status: State "species of special concern".  
Currently exists at Brown Bridge. Nesting activity suspected.

Nesting habitat: Michigan's only truly terrestrial turtle. Inhabits open woodlands, often near water. Like to soak at the edges of ponds or streams in hot weather, but avoids deep water and swims poorly (Harding 1990).

Diet: They eat a variety of small animals and plants including insects, worms, slugs, snails, carrion, mushrooms, berries, and fruit.

g. Spotted turtle

Status: State "species of special concern".

Habitat exists at Brown Bridge but none have been recorded on the property as yet.

**Nesting habitat:** Spotted turtles inhabit small ponds, bogs, sphagnum seepages, and grassy marshes. The primary requirements are clean, shallow water with a mud bottom and ample aquatic and emergent vegetation (Harding 1990).

**Diet:** They eat a variety of small animals and plants including insects, snails, worms, slugs, crayfish, tadpoles, duckweed, algae, and fruit.

## 2. OTHER SPECIES:

### a. Barred Owl

**Status:** Breeding pairs are uncommonly distributed throughout Michigan. Habitat fragmentation due to development is driving resident pairs away and causing a suspected decline in their population numbers.

Brown Bridge contains excellent habitat for this owl and a nest site is suspected to exist in the lowlands below Brown Bridge Dam.

**Nesting habitat:** General habitat requirements nearly "mirror" those of the red-shoulder hawk. Favor mature forests, both deciduous and coniferous. Nest site vegetation ranges from open eastern hemlock and white pine to beech-maple forests to heavily wooded swamps and river bottoms. Barred owls prefer to use natural tree cavities as nest sites. They have been known to nest in old abandoned open-stick nests of hawks or squirrels, though reproductive success under these conditions is rare.

**Diet:** Voles, shrews, and mice.

### b. Mute swan

**Status:** The Mute swan is a locally abundant, introduced species.

**Nesting habitat:** Marshy edges of lakes and ponds, often using abandoned muskrat houses. Pairs of Mute swans will "invade" a cattail marsh to nest. Mute swans are very aggressive towards other waterfowl and there is cause for concern because they directly compete for nesting habitat and displace such native birds as the Common loon and Canada geese.

Diet: Submerged aquatic plants such as duckweed and filamentous algae.

c. Trumpeter swan

Status: State & federal endangered species. Does not exist at Brown Bridge. Historically nested over much of the northern U.S. and Canada. A Michigan Recovery Program was initiated in 1986 by the MDNR. The recovery program is designed to produce 200 wild Trumpeter's by the year 2000.

Nesting habitat: Marshy edges of lakes and ponds. More desirable than the non-native Mute swan because of a lesser tendency to inhibit other waterfowl from their breeding territory.

Diet: Submerged aquatic plants.

Report all unusual occurrences of any State or Federally threatened or endangered animals to: Dr. Leni A. Wilsmann  
Michigan Natural Features Inventory  
P.O. Box 30028  
Lansing, MI 48909

III. FISHERIES / RESERVOIR MANAGEMENT

A. Reservoir Fishery

Sportsmen who have been fishing Brown Bridge Pond for years have noted a decrease in Brown trout populations. Some have suggested that the population decline has coincided with the declaration in the early 70's by the MDNR that the pond is "non-trout waters".

According to Ralph Hay, it is not feasible to manage the reservoir so that brown trout become the dominant fish species again. In addition this would not be in the best interest of the recreationists who fish Brown Bridge in pursuit of the other "game" fish such as pike and bass. More importantly, if Brown Bridge were again declared "trout waters" no other fishing would be allowed other than during trout season. This would eliminate fishing entirely outside of trout season.

A potential study could utilize creel surveys to get a handle on the compensatory mortality of river browns through the ice during the winter. Plug this in with the known natural winter mortality on river browns and it may make a difference in the MDNR's decision. It is believed that brown trout migrate from the river into the reservoir during the winter in search of food. If a significant number of river browns are being caught during the winter through the ice, then there may be a basis for a commission order to close the pond to ice fishing for trout.

Hay added that his department has other more pressing priorities and that any research that is conducted would have to come from outside the DNR. A possible

alternative to managing the reservoir for trout would be to plant trout. Though many would fall prey to the pike, a percentage would survive and become available to the angler in both the reservoir and the river system. Size limits could be removed from the pike to control their populations.

Some sportsman have also requested that walleye be introduced into Brown Bridge. Walleye are another predator of brown trout and should not be introduced into Brown Bridge Pond. The walleye would not only predate on trout in the reservoir, but they would also move up and down stream in search of food.

The benefits of dredging the east end of the reservoir to increase trout habitat should be compared to its cost in a feasibility study. A study would more closely look at all the options and offer potential solutions.

#### **B. Wiggler Digging**

Wigglers are the aquatic larvae of the famous giant Michigan mayfly (*Hexagenia limbata*). The larvae live in the silt on the bottom of the pond and grow to be approximately 2" long. As adults, the nymph emerges from the water and transforms into a winged insect. In both their forms they are an important part of the food chain, especially for fish.

Harvesting wigglers should not be allowed at Brown Bridge. Harvesting the Wigglers not only weakens the food chain, but it also disturbs the aquatic system when netted from the pond bottom.

#### **C. River & Stream Tributaries**

In 1976 the Boardman River was classified by the MDNR as a State Natural River. The purpose of this designation is to preserve and enhance a broad range of values inherent to the Boardman. Three broad classes of river, which relate to the general setting, are recognized by the State. The three classes are : Wilderness; Wild & Scenic; and Country Scenic, The Boardman does not have any portion designated as Wilderness.

The Boardman River above Brown Bridge Dam is designated "Wild & Scenic". The river below the dam is designated "Country Scenic". Special restrictions apply with each designation. In addition, the Boardman is classified as a "Blue Ribbon" trout stream, meaning it contains suitable habitat capable of supporting naturally reproducing trout.

The first order tributaries that drain from the property into river are not affected by the natural river designation.

### **IV. RECREATION / TRAILS & MAINTENANCE**

#### **A. Current Trails**

The Brown Bridge Quiet Area enjoys over 5 miles of hiking trails (Figure 8). Many of these trails have existed since the lumbering days when an extensive network of logging roads and railroad grades criss-crossed the valley slopes as the lumberjacks moved their product to the river.

Up until 1988, this network of trails served as routes for both motorized and non-motorized recreational users. Unfortunately, with the advent of ORVs and increased human use, severe erosion damage followed along the face of the steep north bank. Today, a majority of these old "logging roads" serve as the main hiking trails throughout the Quiet Area.

The trails strictly serve as hiking and cross-country ski trails only. The only exception to this will be when Brown Bridge Road is closed to vehicular traffic. At that time, horses and non-motorized bikes will be allowed on that trail only.

#### **B. Proposed Trails**

In an attempt to maintain the wild character of this immediate area, the Brown Bridge Advisory Committee recommends that the human activity be directed toward the western end of the property (Brown Bridge Dam area), while limiting human activity in the eastern end. This means developing the trail system and constructing a foot-bridge below the dam, as described in the Six-Year Work Plan for Brown Bridge.

#### **C. Brown Bridge Road Closure and Trail Development**

In the fall of 1990, the City Commission voted to approve a petition request from property owners to close a portion of Brown Bridge Road which lies within the City's Brown Bridge property. A proposal was presented to the Board of County Road Commissioners to upgrade an existing seasonal county road (Green Belt Road) to reconnect Scharman Road with Brown Bridge Road instead of constructing a new local collector route on City property.

The stretch of Brown Bridge Road involved crosses through and divides an environmentally sensitive portion of the Quiet Area. The road also makes management more difficult and reduces the area available for hiking trails. Furthermore, the road encroaches on vital wildlife habitat and is dangerous to vehicular traffic as evidenced by the numerous scarred trees.

Deer were found shot by poachers along this stretch of road. Closure of the road is not a new idea, land managers have called for its closure since the early 1970's.

The proposal was accepted by the Road Commission and right of way easements have been secured.

Once closed, a large portion of the old roadbed will remain as a hiking trail and wildlife shrubs will be planted to soften the edges allowing the old road to blend better with the surrounding forest. The shrubs will also provide food and shelter for many species of wildlife, providing the hiker with an exciting display of color and animal life.

Figure 9 contains a map showing the proposed trail system and Brown Bridge Road as a combined recreational trail for hiking, skiing, horseback riding, and non-motorized bikes.

#### D. Trails for Disabled Persons

On July 26, 1990, the United States government enacted the Americans with Disabilities Act (ADA). This act provides comprehensive civil rights protection to individuals with disabilities. In short, a public entity must now ensure equal accessibility by individuals with disabilities to its facilities, programs and services. This includes all activities operated by a public entity for the purpose of benefiting the public.

The operative language of Title II of the ADA is as follows:

Subject to the provisions of (Subchapter II of Chapter 126 of Title 42 of the United States Code), no qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs or activities of a public entity, or be subjected to discrimination by any such entity. 42 USC 12131

The City of Traverse City established a transition plan for complete compliance by July, 1995. The management recommendations contained within this document will fulfill the City's compliance obligation for the Brown Bridge Quiet Area.

#### E. Areas for Potential Trail Development

Appendix "J" contains a map indicating areas where additional trail development is practical.

#### F. Coordinated Management of Surrounding Public Lands

The Grand Traverse County Master Trail Plan (O'Boyle 1991) notes that linkages to the Quiet Area to be made primarily by automobile. But a map in that same document shows proposed non-motorized linkages from the east along the Boardman River and from the west (somehow) from a railroad trail. These two linkages are not recommended for Brown Bridge as proposed in Grand Traverse County's Master Trail Plan.

Rotary Charities of Traverse City, with the recent acquisition of several large tracts of land, now has control over approximately 1800 acres within the vicinity of Brown Bridge. Rotary's property is contiguous to Brown Bridge to the north and is connected by state land to the south.

To that end, the City, Rotary Charities, the MDNR, Grand Traverse County should coordinate the overall management of these properties on a landscape level. This includes the aquatic, timber, wildlife, and recreational resources.

#### G. Parking

Currently five parking areas are offered to the public at Brown Bridge. This includes the East Parking and West Parking areas on the north side; the new Canoe Access Parking area; the Boat Launch Parking area at Buck's Landing; and a small pull-off parking area off Brown Bridge Road.

To accommodate wintertime users of the Quiet Area, four parking areas are plowed two on each side of the reservoir. In 1991, City Light & Power agreed to snowplow the East Parking area on the north side and the Boat Launch Parking area on the south side. This Arrangement makes the most sense to consolidate equipment.

#### H. Restrooms

As numbers of users increase on the north banks, restrooms may be installed.

#### I. Camping

No camping should be allowed at the Quiet Area property.

### V. Signs / Trail Maps

#### A. Signs

##### 1. Quiet Area Boundary

The city should secure a survey to determine the Quiet area Boundaries. Upon completion of the survey the city should resign if necessary the boundary of the "core area" to delineate the "no hunting zone". The entire Quiet Area should be signed. It is recommended that the boundary signs be made of wood more specifically, the wood routed signs created by the crew.

##### 2. Interpretive

Wood routed, interpretive signs should be utilized to inform the public of the natural features found in the area. (i.e. Manistee Moraine, state historic sites, History of Brown Bridge Dam, etc..)

##### 3. Informational

Use international symbols to indicate what's allowed and not allowed. Place trail maps with pertinent information under plexi-glass at the parking areas.

##### 4. Sign Posts

Utilize used power poles to mount interpretive, informational and trail signs on. For the boundary signs, use used power poles, and red-pine treated poles with 4" tops.

5. Directional

Place trail directional signs at all trail junctions to clearly direct visitors.

6. Private Signs on City Property

The Grand Traverse County Road Commission does not permit any private sign installation within the road right-of-way. East Bay township sign ordinance only allows signs outside the road right-of-way if permission is obtained from the property owner. In 1991, the City of Traverse City denied a private individual permission to place a sign on City property at the corner of Hobb's Highway and Gibbs Road (a complaint was filed by an adjoining land owner).

Currently several signs do occur on City property without the permission of the City. Many have been in place for a number of years and, in fact some people may claim, add to the "character" of the area.

To be consistent on this issue, the City should not allow individual private or commercial signs on Brown Bridge property. Instead of immediately removing the signs, the City should work with the sign owners and East Bay Township to develop a community sign for all involved.

B. Trail Maps/Brochures

Permanent trail maps should be placed at all parking areas. Do not post or distribute maps, which may promote use of the area unless authorized to do so by the Advisory Committee.

Brochures are discouraged at this time. They may be more appropriate at a later date.

VI. Information / Education / Research

A. Nature Center / Education

Appendix "J" contains an abbreviated report written by June Mason in 1983 on "The Need For An Environmental Awareness/Nature Center" in the Grand Traverse Area. The report expresses her view that "no consistent program of resource awareness and conservation ethics is offered to the public". It's believed that nature education may be the greatest future value of the Brown Bridge Quiet Area to mankind.

Prior to the first white missionaries arrival in 1839, the Indians utilized the wildlife in the valley for their survival. In the late 1800's, white settlers utilized the area for the lumber it offered and the furs the wildlife provided. In the early 1900's, the river's energy was harnessed to produce electric for the growing City of Traverse City. The 1970's, 80's and 90's saw the oil and gas extracted from underneath the property.

Currently, the two most valuable natural assets the property has to offer recreationists are solitude and its unique biological diversity. But as northern Michigan continues to grow, and more people "discover" Brown Bridge, the solitude that the Quiet Area once offered will fade.

The Nature Education Reserve is in the process of developing a Nature Center in the Boardman Valley area. It is recommended by the Brown Bridge Advisory Committee that the City encourage and support them in their efforts. The ultimate goal is educational opportunities for area residents and visitors regardless of the entity providing the experience. This also would eliminate duplication of efforts and competition for funding.

## **B. Historical**

### **1. Brown Bridge Area History**

The Brown Bridge Area is rich in history. This information should be further researched and compiled for the enjoyment of future generations.

Topics for further research include:

#### **Brown's Bridge & Old State Road**

The exact location of the Bridge and path of the road should be determined then the site should be declared a "State Historic" site. The location should also be marked and signed as such.

#### **Half-Way House**

Not much is known about the Half-Way House that is reported to have been located at Brown Bridge. If enough information is gathered, this site may also qualify with the State Historic designation.

#### **Grasshopper Ranch & Bear Cage**

This portion of the river valley is rich in history that should be further researched. The old bear cage site is located on the uplands, just east of section 14 north of Brown Bridge Road.

### **2. Archeology**

No archaeological sites occur on the State map in the Brown Bridge area. Nevertheless, Barbara Mead, State Bureau of History, believes that the river basin, upstream of the reservoir is a prime area for remnants of mankind's past activities. The high bluff areas and the area surrounding the reservoir are unlikely sites, but she doesn't exclude the possibility.

Quiet Area personnel should be trained to recognize possible clues of an archeological site. These include tiny fragments of burned plant remains, bone, charcoal, bits of pottery, or small pieces of leather. Ms. Mead states that one overriding principle of possibly discovering an archeological site

is: avoid disturbing the soil. If a potential site is discovered, or the City wishes to have a site inventory conducted, contact the Bureau of History of the Michigan Department of State for a list of qualified consultants.

C. Research

Continue research and inventory of Brown Bridge's natural and cultural features. The information generated by the research will be added to the existing inventories and is essential to the continuing management of the Quiet Area. The City should utilize college graduate and post-graduate students to conduct such research. There are hundreds of graduate students to conduct such research. There are hundreds of potential research topics including gypsy moth and pine sawfly control. All research activities must be in the best interest of the City of Traverse City and the Brown Bridge Quiet Area and have the prior approval of the City Commission before any fieldwork is conducted. The Advisory Committee should develop a set of "research guidelines".

VII. Administration / Misc. Operations

A. Property Conservation

Acquire a conservation Easement for the Brown Bridge Quiet Area by end of year 2002 to assure protection of the property in perpetuity.

B. Governing Body

The City of Traverse City should retain ownership and ultimate management control of the Brown Bridge property.

The City and the County have entered into a three-year contract with the Grand Traverse Conservation District to manage countywide quiet recreation parkland. The City will retain ultimate control over the management of Brown Bridge.

The District developed this agreement with Brown Bridge and the County owned Natural Education Reserve in mind. The District is uniquely suited to assist both local units of government in the management of these properties. The District has already been involved in the development of critical area treatment plans for both properties.

C. Brown Bridge Advisory Committee

The City Commission appointed a Brown Bridge Advisory Committee under the direction of the City Manager. The committee will meet quarterly unless otherwise notified by the chairman. Tenure will last three years with staggered appointments. The recommended committee size is 12 persons with 50% being residents of Traverse City.

To improve group efficiency, various task forces and subcommittees should be formed to advise the full committee. Task force members need not be Advisory Committee members. This enables the committee to access needed skills, broaden

representation, and undertake more responsibilities without having to expand the Advisory Committee. Service on a task force by a non-committee member becomes a vehicle for recruiting new committee members over time.

#### D. Caretaker

The City should maintain a full-time, on-site caretaker that coordinates the execution of the work plan and responds to complaints or violations of Quiet Area rules. This person should have the authority to issue "appearance notices" for any Quiet Area violations. In addition, this individual will patrol Brown Bridge and Sabin dams for City Light and Power. The Parkland Steering Committee, in conjunction with the Brown Bridge Advisory Committee, will develop the duties for Caretaker.

#### E. Quiet Area Rules

The City of Traverse City has no legal authority to impose parkland restrictions at Brown Bridge. As property owners, the City may sue for damages if someone causes obvious damage, but unless the damage is clear, prosecution is difficult. Since Brown Bridge spans two different townships, (East Bay Township – 1200 acres; Paradise Township 40 acres) it makes most sense to employ county rules.

The City Attorney suggests that the City of Traverse City enter into an inter-governmental agreement with Grand Traverse County to adopt rules for Brown Bridge. Terms of this agreement would have to be worked out by both parties involved.

#### F. Enforcement

The Grand Traverse County Sheriff's Department should provide enforcement. The caretaker should have authority to issue "appearance notices" for simple violations of parkland rules.

#### G. Emergency Access

Appendix "K" contains a Maintenance and Emergency Access Map showing vehicular access routes into the Quiet Area. This map, along with at least one key (which opens all the gates on the property) should be distributed to all the appropriate emergency response units (i.e. Central dispatch, East Bay township, Paradise Township, Garfield Township, etc..).

Currently East Bay Township does not respond to calls south of Brown Bridge Road (Appendix "K"). It is recommended that East Bay Township's response area be expanded to Scharmen Road (the township line) to alleviate any potential emergency response confusion.

## **H. Group use**

### **1. GROUP TOURS:**

At the present time, large group use at Brown Bridge should be discouraged unless the activity occurs during low use hours such as weekdays. Group activity may diminish the serenity and solitude that the area offers individual users. In future years, the City may want to consider guided group tours to handle large volumes of users.

### **2. GROUP EVENTS:**

All requests for group events should have prior review by the Advisory Committee to assure event is compatible with the Quiet Area environment.

## **I. Publicity**

Manage publicity of Brown Bridge. Currently serenity and solitude to those who "discover" Brown Bridge are significant tangible values of the Quiet Area.

## **J. Labor**

To carry out the work plan Brown Bridge should utilize prison labor from Camp Pugsley as in past years. The City should share the cost of the crew with the GTCDC.

## **K. Buildings**

The City Commission has earmarked funds and work plan time to remove the existing caretaker's house and construct a new building near Brown Bridge Road and away from the pond.

A plan for the use of the "Prevo" log cabin should be developed by the end of year 2003.

## **L. Property Acquisition and Easements**

The City should secure the following critical lands and easements surrounding Brown Bridge (Figure 10).

- Georgia Halladay property – approximately 40 acres of property that is located west of the "drop forty" and east of the Boardman River. The acquisition of this property will secure riverfront property and vital wildlife habitat. In addition, this property extends north across Brown Bridge Road and if ever developed will compromise the serenity of the Quiet Area.
- W. Donner & Napoleon Chagnon (easement) – by securing these easements, the City of Traverse City and City Light & Power will have

permanent access to the north end of the dam area. City Light & Power has expressed desire to construct an access road from the Haggard Oil & Gas Exploration Inc. well site, this is not recommended. Securing this easement will eliminate the need for such a road by City Light & Power.

- Edward & Jane Mueller property – approximately 245 acres of property surrounding Spring Lake. The property is contiguous to Brown Bridge to the north and Rotary to the west. Partial acquisition of the south half of the property and lake will add considerably to the quiet recreational and educational opportunities that Brown Bridge has to offer. Development of this property could compromise the serenity of this portion of Brown Bridge. A conservation easement is a reasonable alternative if acquisition is not possible.
- Road Easement – The proposed connection of Scharmen Road and Brown Bridge Road will require the upgrade of an existing county road as described in Section 3, part IV (C) of this report.

#### **M. Endowment Fund & Memorial Gifts**

Establish an Endowment Fund so individuals may leave a memorial gift to honor a friend or family member. Deposit all gifts into the Endowment Fund to be used for development and land acquisition of the Quiet Area unless the donor specifically requests that the funds be used for another purpose. All requests must be consistent with Quiet Area goals and have prior review by the Advisory Committee. Notify his or her family of the donation.

### **VIII. Monitoring Plan**

Response is an important and major concept in all management plans because it indicates the short-term outcome of the management actions. Response of wildlife populations, habitats, and people should be the focus of evaluation to assess the success of the objectives. The evaluation process should be kept simple and inexpensive, but yet provide dependable information.

Evaluation provides the intelligence for fine-tuning or redirecting the management process. This is essential if the Quiet Areas goals and objectives are to be revised as new information is received. Evaluation is the integral feedback link that allows management to be an adaptive response process, therefore always keeping the plan opened and subject to change.

#### **A. Human**

To solicit input, hold public meetings when considering rule development.

The information generated by public meetings and written comment will help focus Brown Bridge's future goals and objectives.

## **B. Wildlife**

**Encourage research to update species lists both aquatic and terrestrial.**

**Quiet Area personnel should keep a daily species count list to determine relative abundance's of wildlife populations. The City can then utilize this information to help determine if harvest of certain animals is necessary (i.e. Canada Geese, raccoon, deer, etc..)**

**The City should also develop and implement yearly browse surveys to determine the impacts of deer populations on the vegetation. Browse surveys are time efficient and provide valuable management information.**

**The City should require trappers to record all animals trapped on the property with the caretaker. The information collected should include harvest location, species, sex, length, weight, and condition. In addition, an incisor should be extracted (important to extract the entire root) to potentially age the animal.**

**To keep track of fishing success and relative fish abundance, the City should develop a questionnaire to be placed at Buck's Landing.**

**Wood or Box turtles, both "State Species of Special Concern" should be checked for marks and recorded. If no marks are found, they should be marked using a hack-saw blade for future identification.**

## **C. Flora**

**Encourage research to update species lists both aquatic and terrestrial.**

**Knowledgeable persons should be solicited to conduct orchid surveys and counts as deemed necessary by the Brown Bridge Advisory Committee.**

**Quiet Area personnel should know how to identify threatened or endangered plants that may occur on the property or that habitat exists for their presence but have not yet been documented (i.e. Monkey flower).**

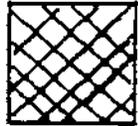
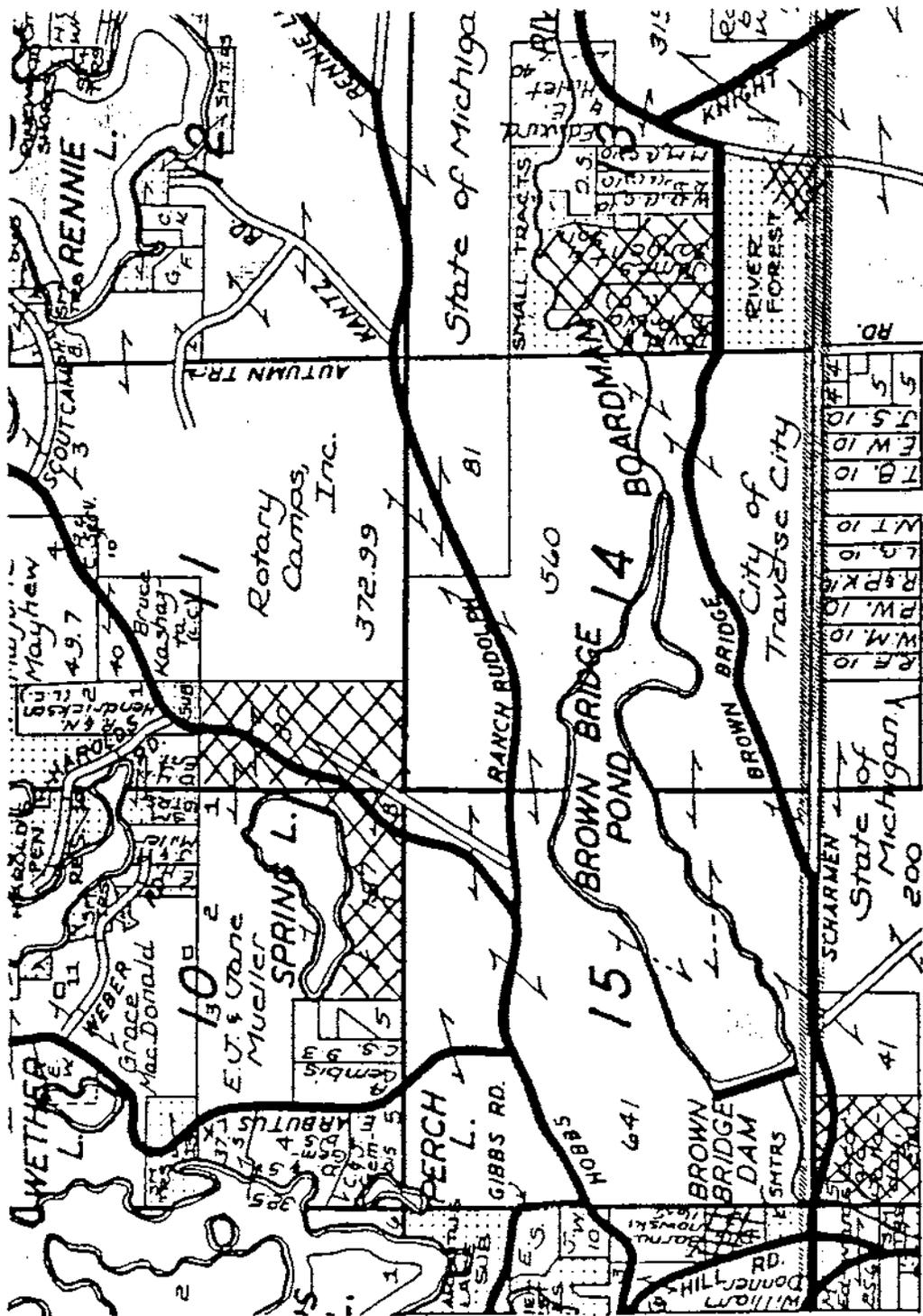


Figure 10

CRITICAL LAND that the City of Traverse City should secure through purchase or conservation easements.