EXECUTIVE SUMMARY

This assessment of the Boardman River watershed is one of a series being prepared by the Michigan Department of Natural Resources (MDNR), Fisheries Division for Michigan rivers. This report describes the Boardman River watershed and its biological communities.

River assessments are intended to provide a comprehensive reference for individuals who seek information about a river system. River assessments compile known information about the watershed and demonstrate how the river is influenced by the physical landscape and the rivers relationship to biological communities. River assessments are prepared to help identify problem areas and provide opportunities for solving these problems. They also identify areas where information is needed to better understand, manage, and protect the river. It is anticipated that this assessment will encourage citizens to become involved in the decision-making process that will benefit the river and its users.

This document consists of four principal sections: introduction, river assessment, management options, and public comments (with MDNR responses). The river assessment is the nucleus of the document. The characteristics of the Boardman River watershed are described under thirteen sections: geography, history, geology, hydrology, channel morphology, dams and barriers, soils and land use patterns, special jurisdictions, water quality, biological communities, fisheries management, recreational use, and citizen involvement.

The management options section identifies a variety of challenges and opportunities for protection, rehabilitation, or obtaining additional information to better understand the Boardman River. These management options are organized according to the main sections in the river assessment. The management options listed are not necessarily recommended by MDNR, Fisheries Division, but are intended to provide a foundation for public discussion and aid in planning for the future of the Boardman River watershed.

The Boardman River watershed drains 287 square miles of land in Grand Traverse and Kalkaska Counties. The watershed also contains 179 lineal miles of perennial streams and 97 natural lakes. For the purposes of this document, the Boardman River main stem is divided into three major sections based on a gradient of physical attributes that change over the course of the River. The sections are: the headwaters to the former Brown Bridge Dam (31.4 miles), the former Brown Bridge Dam to Boardman Dam (12.6 miles), and Boardman Dam to the mouth (6.4 miles).

The Boardman River watershed generally have flat to rolling topography and typically do not support agriculture.
Expansive cedar swamps are also typical of the outwash plain. Glacial till (end moraines) and outwash make up 93% of the Boardman River watershed surficial geology.

The Boardman River watershed also contains numerous “pit or kettle” lakes such as Arbutus and Spider. These lakes are contained in outwash plains and were formed as glaciers retreated and left behind large, isolated blocks of ice. These ice blocks were covered in outwash as meltwater flowed from the glacier. Eventually, the outwash-covered ice melted and left basins, which have since been filled with water to form these lakes.

The hydrology of the Boardman River watershed encompasses the movement, distribution, and quality of subsurface, surface, and atmospheric water. The Boardman River is classified as one of the most stable rivers in the state because it has a standardized 5% exceedence (high) flow that is less than twice its median flow. Other rivers in the state that exhibit this level of stability include the Jordan, Manistee, and Au Sable rivers. The hydrologic stability of the Boardman River and its tributaries is environmentally and socially significant. The hydrologic stability buffers the watershed from flashy flood flows that are typical of watersheds with numerous dams, extensive development, or non-permeable soil profiles.

The Boardman River channel drops 495 feet and averages 11 feet/mile gradient from the headwaters to the confluence with Lake Michigan. Gradient remains relatively stable throughout the main stem except in the lower section (Boardman Dam to the mouth) where there is a significant increase in gradient resulting from channel aggradation through a glacial end moraine deposit laden with coarse-textured material. There are currently three dams within this section that impound the historic rapids. The historic rapids within this section are unique and rare in the lower peninsula of Michigan. The Keystone Rapids are indicative of the high quality aquatic habitat that is currently impounded by the three dams.

There are 20 dams in the Boardman River watershed that have at least six feet of head. The three largest dams are Union Street, Sabin, and Boardman, all located within six miles of the river mouth. There are currently no dams within the watershed that produce hydropower. Dams degrade aquatic species and habitat through fragmentation of habitat and intra-species interaction, disruption of natural flow regimes, disruption of natural transportation of sediment and organic material, genetic degradation, and introduction of invasive species. The Boardman River Dams Implementation Team is currently pursuing removal of Sabin and Boardman Dams and modification of Union Street Dam.

The relatively stable flow regime of the Boardman River and its tributaries is primarily due to soil constituency and land use practices within the watershed. Sandy glacial drift comprises approximately 62% of the watershed and is defined by sandy soil such as the Kalkaska, Grayling, and Rubicon soil series. The Fruit Belt comprises 38% of the watershed and is defined by poorly drained organic soils such as Tawas and Carbondale, which are generally dry and acidic in nature, with medium to low fertility depending upon the percent sand composition. The predominant sandy soil constituency of the watershed contributes to its stable flow regime. However, sandy soils are prone to erosion. There are 306 erosion sites and 84 road crossing sites that have been identified on the Boardman River.

The Boardman River watershed has a variety of special designations including 36 miles of Blue Ribbon Trout Stream, 13 designated trout streams, and a State Natural Rivers designation. These designations are a result of diverse aquatic, semi-aquatic, and terrestrial habitat within the watershed that supports significant wildlife populations. Currently the watershed supports three state threatened species (Bald eagle, common loon, and red-shouldered hawk), two state endangered species (king rail and Kirtland’s warbler), three state species of concern (Hill’s thistle, wood turtle, and ebony boghaunter), and five unique habitat types (Great blue heron rookery, dry-mesic northern forest, northern fen, oak-pine barrens, and rich conifer swamp).
The water quality of the Boardman River watershed is generally good, due primarily to the limited amount of development within the watershed. However, increasing developmental pressure within the watershed has the potential to negatively affect aquatic species and habitat. Sediment is the primary non-point source discharge in the watershed. Excessive sediment inflow into the Boardman River watershed adversely affects aquatic habitat and species by disrupting natural flow dynamics that create and maintain critical habitat features such as spawning riffles. The primary sediment inflow sites are road and trail crossings. There are also 11 NPDES permits currently issued within the Boardman River watershed.

A total of 56 species of fish presently inhabit or recently inhabited the Boardman River watershed. Thirty-nine species are native and presently exist within the watershed, one (Arctic Grayling) is native but extirpated, six are native but their current status is unknown, six were introduced and presently exist within the watershed (including the Sea Lamprey, which colonized the Boardman River watershed via the Welland Canal), and four were introduced but their current status is unknown.

The only documented native salmonid in the Boardman River watershed was the Arctic Grayling, although Lake Trout may have been present seasonally. However, in the mid- to late 1800s other salmonids were introduced, including Brook Trout, Brown Trout, and Rainbow Trout. By the turn of the Eighteenth century, Arctic Grayling were extirpated from the Boardman River. Today, the Boardman River supports a typical coldwater resident and migratory fishery consisting of self-sustaining Brook and Brown trouts, and stocked steelhead, Chinook, and Coho salmons (below Sabin Dam). Minimal natural reproduction of migratory salmonids including steelhead, Coho Salmon, and Chinook Salmon has been documented in the Boardman River below Sabin Dam and in several tributaries.

The Boardman River watershed hosts approximately two million recreational user days per year. The watershed offers a variety of public recreational opportunities. There are five state forest campgrounds and a comprehensive trail system that supports biking, hiking, horseback riding, and snowmobiling. State forest public land comprises thirty-two percent (58,292 acres) of the entire Boardman River watershed.

Public involvement in the management, protection, restoration, and enhancement of the Boardman River watershed is a crucial component of sustaining the long-term health of the watershed. There are numerous avenues available for public involvement in sustaining the health of the Boardman River watershed including participation in non-profit groups such as the Grand Traverse Conservation District, the Conservation Resource Alliance, the Grand Traverse Regional Land Conservancy, the Watershed Center Grand Traverse Bay, and the Boardman River Dams Implementation and Prosperity Teams.