PERIPHYTON COMMUNITY ANALYSIS SUMMARY
BOISE RIVER STUDY
MARCH, 2007

Prepared by

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INTRODUCTION

Attached algal communities from collection sites on the Boise River have been examined in order to assess biological water quality. This process has two important outcomes. First, analysis of this type can provide a good deal of information concerning extant water quality. Second, by examining changes through time, it may be possible to determine longer-term changes in water quality.

FIELD METHODS

Attached algal communities (periphyton) were sampled from six locations during 2007. These periphyton communities have been examined, identified and scored according to relative abundance. Specific data from this analysis can be found in the appendix of this report.

Samples were collected from the following locations:

Site	Date
Veteran's	3/14/2007
Glenwood	3/14/2007
Barber (Eckert Road)	3/14/2007
Middleton	3/15/2007
Caldwell	3/15/2007
Parma	3/16/2007

LABORATORY METHODS

After delivery to our laboratory, periphyton samples were studied as soon as possible to ensure freshness. Samples were subsampled several times and several wet mounts were prepared from each sample to ensure that all algae present in the original sample were represented as accurately as possible during microscopic analysis. Subsamples were placed on 1x3 inch glass microscope slides and examined microscopically.

Filamentous, colonial, and single celled algal forms were identified to the lowest taxonomic level possible. Some taxa could not be identified to species level due to the absence of reproductive cells or the small number of cells present in the sample. Such taxa were therefore identified to the generic level and are listed in this report as "species" following the generic name.

A relative abundance for each taxon was estimated during microscopic examination of the subsamples and recorded as rare, common or abundant. In general, if a taxon was

observed only as a single or very few specimens, it was recorded as rare. If a taxon was present in up to approximately 10% of the microscopic examination fields, it was recorded as common. If a taxon was present in more than 10% of the examination fields it was recorded as abundant.

Samples were also evaluated for total biomass present (estimated as low, moderate or high), conspicuous odors, and the presence of vascular plants. This information was recorded and is presented according to sample in the section entitled notes at the end of each data sheet appended to this report.

The examination of periphyton samples is a qualitative process intended to generate a comprehensive list of algal taxa in a sample, and provide an estimate of the species composition of the habitat from which the sample was collected. As specified in the Academy of Natural Sciences, Philadelphia publication "Protocols for the Analysis of Algal Samples Collected as Part of the U.S. Geological Survey National Water-Quality Assessment Program," identification of every algal taxon in a sample will most likely not occur in a qualitative analysis of a periphyton sample. It is generally agreed, however, that a majority of the species in a sample will be encountered in a "reasonable search."

Microscopy

Microscopy was performed using Nikon Eclipse E200 microscopes equipped with Nikon's CFI60 infinity optical systems and a Zeiss RA research microscope equipped with differential interference contrast and phase-contrast optical systems.

Identifications were performed using standard taxonomic works and reference slide collections in our laboratory. The results of this analysis are reported in the tables in the appendix of this report.

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Table 1. 2007 Boise River Periphyton Species List

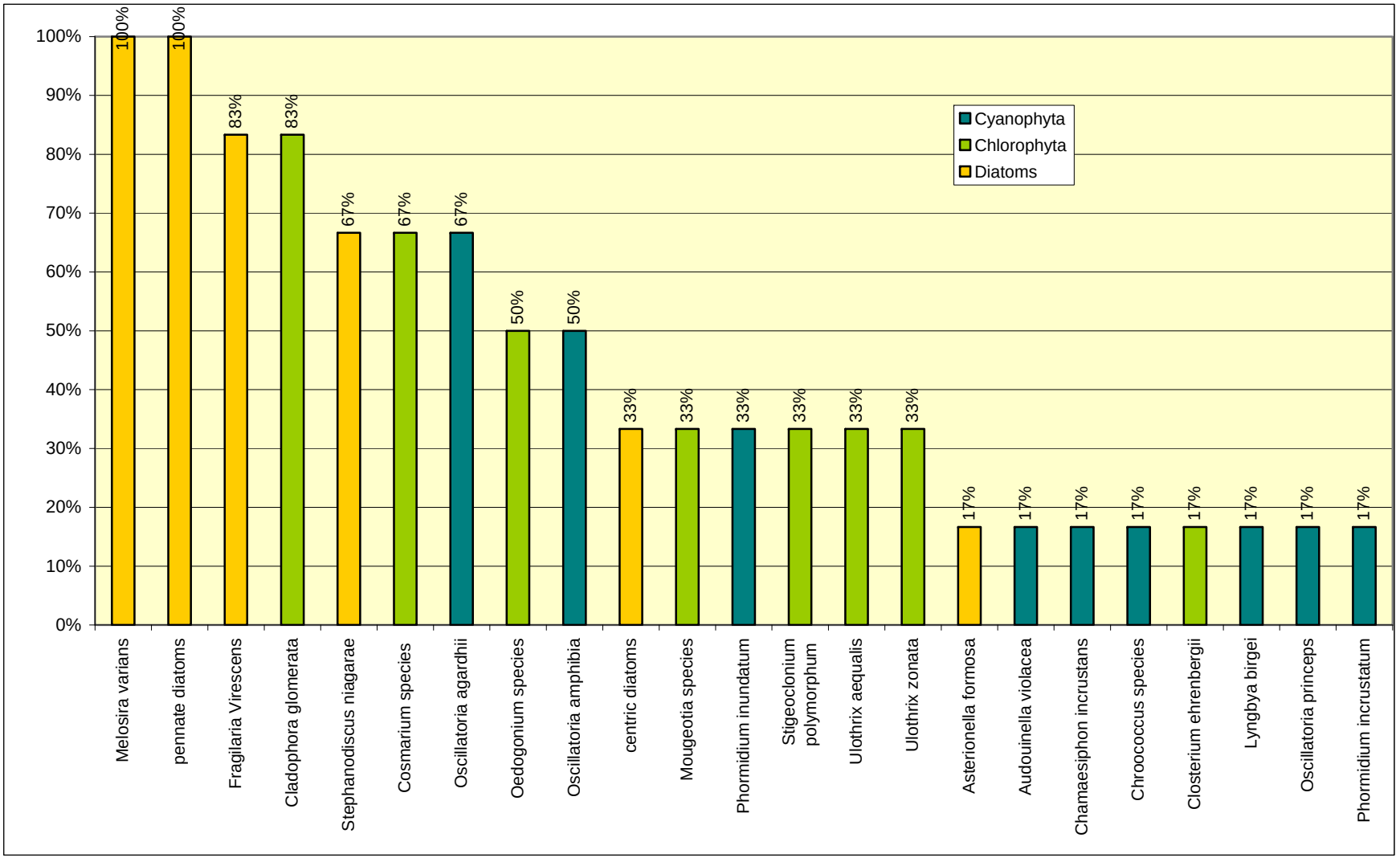
Algal species listed by category found in Boise River samples collected in 2007. The categories Centric and Pennate diatoms contain many additional species.

Taxon	Number of Occurrences in Sample Set
Cyanophyta	
Audouinella violacea	1
Chamaesiphon incrustans	1
Chroococcus species	1
Lyngbya birgei	1
Oscillatoria agardhii	4
Oscillatoria amphibia	3
Oscillatoria princeps	1
Phormidium incrustatum	1
Phormidium inundatum	2
Chlorophyta	
Cladophora glomerata	5
Closterium ehrenbergii	1
Cosmarium species	4
Mougeotia species	2
Oedogonium species	3
Stigeoclonium polymorphum	2
Ulothrix aequalis	2
Ulothrix zonata	2
Diatoms	
Asterionella formosa	1
Centric diatoms	2
Fragilaria virescens	5
Melosira varians	6
Pennate diatoms	6
Stephanodiscus niagarae	4

Table 2. Percentage of estimated abundance categories of major taxa (occurring three times or more) found in Boise River samples collected in March, 2007.

Species	Number of Occurrences	% Present in All Samples	% Rare	% Common	% Abundant
Asterionella formosa	1	17%	100%	0%	0%
Audouinella violacea	1	17%	100%	0%	0%
Centric diatoms	2	33%	100%	0%	0%
Chamaesiphon incrustans	1	17%	100%	0%	0%
Chroococcus species	1	17%	100%	0%	0%
Cladophora glomerata	5	83%	60%	20%	20%
Closterium ehrenbergii	1	17%	100%	0%	0%
Cosmarium species	4	67%	25%	0%	0%
Fragilaria virescens	5	83%	0%	80%	20%
Lyngbya birgei	1	17%	0%	0%	100%
Melosira varians	6	100%	33%	67%	0%
Mougeotia species	2	33%	100%	0%	0%
Oedogonium species	3	50%	67%	33%	0%
Oscillatoria agardhii	4	67%	50%	50%	0%
Oscillatoria amphibia	3	50%	100%	0%	0%
Oscillatoria princeps	1	17%	100%	0%	0%
Pennate diatoms	6	100%	0%	0%	100%
Phormidium incrustatum	1	17%	100%	0%	0%
Phormidium inundatum	2	33%	0%	100%	0%
Stephanodiscus niagarae	4	67%	100%	0%	0%
Stigeoclonium polymorphum	2	33%	100%	0%	0%
Ulothrix aequalis	2	33%	50%	50%	0%
Ulothrix zonata	2	33%	100%	0%	0%

Figure 1. Occurrence of taxon in periphyton samples from Boise River collected in March, 2007.



Appendix: Data from Boise River Periphyton Samples Collected March, 2007

Periphyton Community Composition Analysis 2007

Project Name: Boise River Periphyton
Site Name: Boise River at Parma
Lab ID#: SR070043
Date: 3/16/2007
Analyst: Sarah Rushforth

Category:	**Species:**	**Frequency:**
Cyanophyta:		
	Audouinella violacea	Rare
	Chamaesiphon incrustans	Rare
	Oscillatoria amphibia	Rare
Chlorophyta:		
	Cladophora glomerata	Abundant
	Oedogonium species	Rare
Diatoms:		
	Centric diatoms	Rare
	Pennate diatoms	Abundant
	Melosira varians	Rare
	Stephanodiscus niagarae	Rare

Notes:
Sample with dense biomass comprised primarily of diatoms and green algae (***C. glomerata***). Some blue-green algae also present. ***C. incrustans*** occurring as epiphyte on ***A. violacea***.

Periphyton Community Composition Analysis 2007

Project Name: Boise River Periphyton
Site Name: Boise River at Glenwood
Lab ID#: SR070039
Date: 3/14/2007
Analyst: Sarah Rushforth

Category:	**Species:**	**Frequency:**
Cyanophyta:		
	Lyngbya birgei	Common - Abundant
	Oscillatoria agardhii	Common
	Oscillatoria amphibia	Rare
Chlorophyta:		
	Cosmarium species	Rare
	Stigeoclonium polymorphum	Rare
	Ulothrix aequalis	Rare
	Ulothrix zonata	Rare
Diatoms:		
	Pennate diatoms	Abundant
	Fragilaria virescens	Rare
	Melosira varians	Rare
	Stephanodiscus niagarae	Rare

Notes:
Pennate diatoms super abundant and diverse. Other algal biomass relatively low, including several species of filamentous green and blue-green algae.

Periphyton Community Composition Analysis 2007

Project Name: Boise River Periphyton
Site Name: Boise River at Caldwell
Lab ID#: SR070044
Date: 3/15/2007
Analyst: Sarah Rushforth

Category:	**Species:**	**Frequency:**
Cyanophyta:		
	Chroococcus species	Rare
	Oscillatoria agardhii	Rare
	Oscillatoria amphibia	Rare
	Phormidium inundatum	Common
Chlorophyta:		
	Cladophora glomerata	Rare
	Cosmarium species	Rare
Diatoms:		
	Pennate diatoms	Abundant
	Fragilaria virescens	Rare - Common
	Melosira varians	Common

Notes:
Algal biomass comprised primarily of Pennate diatoms, which are abundant and diverse. Filamentous blue-green algae present as well as rare filamentous green algae.

Periphyton Community Composition Analysis 2007

Project Name: Boise River Periphyton
Site Name: Boise River at Middleton
Lab ID#: SR070040
Date: 3/15/2007
Analyst: Sarah Rushforth

Category:	**Species:**	**Frequency:**
Chlorophyta:		
	Cladophora glomerata	Common
	Cosmarium species	Rare
	Mougeotia species	Rare
	Ulothrix zonata	Rare
Diatoms:		
	Pennate diatoms	Abundant
	Fragilaria virescens	Common
	Melosira varians	Common

Notes:
Abudnant and diverse Pennate diatoms. Remaining algal biomass comprised primarily of filamentous green algae. No blue-green algae present in the mounts analyzed.

Periphyton Community Composition Analysis 2007

Project Name: Boise River Periphyton
Site Name: Boise River at Veterans
Lab ID#: SR070041
Date: 3/14/2007
Analyst: Sarah Rushforth

Category:	**Species:**	**Frequency:**
Cyanophyta:		
	Oscillatoria agardhii	Common
	Oscillatoria princeps	Rare
	Phormidium incrustatum	Common
Chlorophyta:		
	Cladophora glomerata	Rare
	Closterium ehrenbergii	Rare
	Cosmarium species	Rare
	Oedogonium species	Rare
	Stigeoclonium polymorphum	Rare
	Ulothrix aequalis	Common
Diatoms:		
	Centric diatoms	Rare
	Pennate diatoms	Abundant
	Fragilaria virescens	Common
	Melosira varians	Common
	Stephanodiscus niagarae	Rare

Notes:
Abundant and diverse Pennate diatoms. Other algal biomss comprised primarily of filamentous blue-green and green algae.

Periphyton Community Composition Analysis 2007

Project Name: Boise River Periphyton
Site Name: Boise River at Barber (Eckert)
Lab ID#: SR070042
Date: 3/14/2007
Analyst: Sarah Rushforth

Category:	**Species:**	**Frequency:**
Cyanophyta:		
	Oscillatoria agardhii	Rare
Chlorophyta:		
	Cladophora glomerata	Rare
	Mougeotia species	Rare
	Oedogonium species	Common
Diatoms:		
	Pennate diatoms	Abundant
	Asterionella formosa	Rare
	Fragilaria virescens	Common
	Melosira varians	Common
	Stephanodiscus niagarae	Rare

Notes:
Sample with relatively low biomass. Abundant and diverse diatoms. Very little blue-green algae in non-diatom biomass. Some filamentous green algae present.