

Maine Board of Pesticides Control

2004 DRIFT STUDY OF AERIALY APPLIED BLUEBERRY PESTICIDES

Think
First...



Spray
Last!

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1. Introduction and Objective

Every year since 1999, the Maine Board of Pesticides Control (BPC) has assessed the Narraguagus and Pleasant River watersheds for the occurrence of pesticide drift by looking for off target residues in the water and on drift cards set up next to the water. These two Maine river systems support endangered Atlantic Salmon (*Salmo salar*), and meander through blueberry barrens in Washington County. A summary of the past six years of data appears in Appendix A. Two aerially applied pesticides were focused on by the BPC for the 2004 study; a fungicide with the trade name of Indar and the active ingredient fenbuconazole, and an insecticide with the trade name Imidan and the active ingredient phosmet. Orbit, with the active ingredient propiconazole, was not used in 2004.

The objective for this 2004 study was to continue to collect data to add to what was obtained in past years, while experimenting with new modes of sample collection. Specifically, BPC worked with individuals from the Pleasant and Narraguagus River Watershed Councils and the University of Maine at Machias who were trained to collect samples. This increased the efficiency of sample collection by saving time and money. A number of BPC staff trips from Augusta to Washington County and the associated over night stays and gasoline costs were prevented. In addition BPC worked with a graduate student at the University of Maine at Orono to utilize passive samplers called polar organic chemical integrative samplers (POCIS), to negate the need for precise timing of sample collection with pesticide applications. A detailed report on the POCIS findings will be available at the BPC main office.

2. Sampling Site Location and Sampling Methodology

As in the past few years, BPC field staff worked with the spray coordinators from Maine's two largest blueberry-growing companies, Jasper Wyman and Sons, Inc. and Cherryfield Foods, Inc., to determine when and where aerial applications of Indar and Imidan were to be conducted. Sampling sites were chosen on or next to surface water bodies by BPC based on the proximity to pesticide application sites and accessibility for samplers and equipment. Six of the nine 2004 sites are pictured in Appendix B, and Appendix C displays relevant maps.

A global positioning system (GPS) unit was used to document sample site location. The following table provides information relevant to 2004 site locations.

TABLE 1. 2004 SAMPLING SITES			
DESCRIPTION	BPC SITE DESIGNATION	LATITUDE¹	LONGITUDE
Narraguagus River Watershed			
Bog Brook Flowage 1 (approx. 1600' upstream of bridge)	14BPCS071	44°47'12.7"	-67°59'59.6"
Bog Brook Flowage 2 (near bridge and passive sampler)	14BPCS067	44°47'18.6"	-68°00'22.2"
Bog Brook Flowage 3 (approx. 900' downstream of bridge)	14BPCS070	44°47'14.5"	-68°00'26.0"
Pork Brook north west	05BPCS003	44°46'09.7"	-68°05'10.1"
Pork Brook south east (near passive sampler)	05BPCS004	44°46'04.3"	-68°04'47.9"
Pleasant River Watershed			
Pleasant River main stem (near passive sampler)	14BPCS042	44°43'57.2"	-67°53'50.6"
Montegail Pond			
South side next to pump	14BPCS064	44°45'04.5"	-67°46'19.9"
South west side (small peninsula)	14BPCS065	44°45'02.3"	-67°46'30.4"
Pretty Pond			
North side next to pump	14BPCS066	44°49'45.3"	-67°54'17.1"

¹ Datum = NAD83

A significant challenge when conducting this study in past years was timing the sampling with the time of pesticide application. Travel time to get to the sampling sites from Augusta was considerable, and once there, the weather was often fickle, altering spray schedules. This 2004 study was conducted like other years, but a couple of new approaches were also taken. First, an effort was made to enlist and train local samplers. A student and a professor from the University of Maine at Machias and a couple volunteers from the Pleasant and Narraguagus River Watershed Councils were given sampling equipment and a folder containing pesticide information and standard operating procedures (SOPs). Since they were already in the area, they could more easily sample in a last minute situation, when the weather might clear suddenly for example. BPC staff met with the local samplers at each of the sampling sites and described sampling procedures. Secondly, a graduate student at the University of Maine at Orono used POCISs at four general sites in the area. The student placed the devices just under the surface of the water at the beginning of July and collected them about a month later when they were analyzed at a laboratory. BPC, with the help from local volunteers, was able to collect water samples and/or drift cards from three of these four general POCIS sites, in addition to collecting samples from several other sites, as seen in the table above.

Drift cards with 185mm diameters were put out on the banks of the chosen surface waters prior to spraying and the cards and water samples were collected, using new gloves, within hours to days after spraying was completed. The drift card is a laboratory grade piece of filter paper mounted on a small piece of unused cardboard (see Fig. 2 in Appendix B). Occasionally, samplers arrived on site after a pesticide application, and only surface water grab samples were

collected. Each water sample was collected in a 950 ml amber glass jar with a Teflon-lined cap certified as pre-cleaned for the collection of pesticide samples. Each drift card, when collected, was placed into a similar but smaller amber glass jar. These jars were placed immediately in iced coolers to preserve the samples by preventing exposure to sunlight and maintaining cool temperatures. Samples were delivered, per established BPC chain-of-custody procedures, to the University of Maine at Orono, Food Chemical Safety Laboratory as soon as possible and at least within 96 hours of collection, except when the samples were frozen. Frozen samples are indicated below and discussed in the last section of this report.

BPC standard operating procedures for the collection of environmental samples were observed throughout the sampling program, including the collection of equipment blanks, field blanks, and sample duplicates. At least one field blank and one sample duplicate were analyzed for each 20 samples. All QA/QC sample results were acceptable. In addition, the University of Maine, Food Chemical Safety Laboratory maintains a quality assurance project plan (QAPP) with quality assurance/ quality control (QA/QC) protocols for the Board of Pesticides Control and the United States Environmental Protection Agency for the analysis of samples used in the enforcement of state and federal pesticide regulations.

3. Results

Of the nine sampling sites for 2004, five sites had positive detections of fenbuconazole or phosmet either on drift cards or in the water or both. Fenbuconazole was detected at one of the sites (not all sites were sampled after fenbuconazole applications). Phosmet was found at four sites. All results are described in the sections below.

Results for Narraguagus River Watershed:

Fungicide application: Only one site in the Narraguagus River Watershed was sampled after a fungicide application. Indar was aerially applied 5/10/04 to a number of fields, but the 35-acre field closest to the sampling site, called Big Pine 1, was not treated (see map #1 in appendix C). Table 1 below shows a positive detection of fenbuconazole in water at Bog Brook Flowage near the method detection limit (its duplicate was non detect). Field conditions are also summarized below. The samples were hand delivered to the laboratory 5/11/04.

**Table 2. Surface Water Monitoring Results
 Narraguagus River Watershed
 5/10/04 Application of Indar – water samples collected 5/11/04 at 9:30 AM**

Water Body	Site ID	Wind		Approx. treated field distances (feet)		Fenbuconazole Results*		
		Speed (mph)	Direction	Closest to site	Upwind of site	Water (ppb)	Drift card (ug)	Number of samples analyzed
Bog Brook Flowage 2	14BPCS067	3-8	From SSW	1000	1000	0.11, ND**, ND (QA/QC blank)	NA***	1 water with duplicate and field blank, 0 drift cards

*Method Detection Limit (MDL) = 0.1 ppb for water

**ND = Not Detected

***NA = Not Analyzed

Insecticide application:

After the aerial application of the insecticide Imidan on the morning of 7/25/04, site 14BPCS067 was again sampled, in addition to sites 14BPCS071, 14BPCS070, 14BPCS068, and 14BPCS069. Water samples and drift cards were collected about 3PM that same day and frozen. The field closest to the Bog Brook Flowage sites 1 and 2, Big Pine 1, was not treated with Imidan on 7/25/04. Pork Brook's bearing fields 11 and V were both treated 7/25/04 (see Map #2 in Appendix C). Frozen samples were delivered to the laboratory 7/28/04.

Table 3. Surface Water Monitoring Results Narraguagus River Watershed 7/25/04 Application of Imidan – samples collected 7/25/04 at 3PM								
Water Body	Site ID	Wind		Approx. treated field distances (feet)		Phosmet Results*		
		Speed (mph)	Direction	Closest to site	Upwind of site	Water (ppb)	Drift card (ug)	Number of samples analyzed
Bog Brook Flowage 1	14BPCS071	5-7	From NE	1500	None or far	ND	ND	1 water and 1 drift card
Bog Brook Flowage 2 (near passive sampler)	14BPCS067	5-7	From NE	1000	None or far	ND	ND	1 water and 1 drift card
Bog Brook Flowage 3	14BPCS070	5-7	From NE	150	None or far	ND	ND	1 water and 1 drift card
Pork Brook northwest	05BPCS003	3-5	From NNE	100	2000	0.46	3.79	1 water and 1 drift card
Pork Brook southeast (near passive sampler)	05BPCS004	3-5	From NNE	100	2000	0.97	2.06	1 water and 1 drift card

*MDL = 0.2ppb for water and 0.1ug for drift cards

Results for Pleasant River:

Fungicide Application:

No sites were sampled in the Pleasant River Watershed sampled during the aerial application of Indar.

Insecticide Application:

Drift cards were not used at the Pleasant River main stem location, as samplers could not get to the sampling site until after the application of Imidan. As Table 3 shows, only a grab sample of water was collected. The result was negative for phosmet, as expected, because of the late sample collection time three days after the spray event. This sample was frozen and delivered to the laboratory 7/28/04. The closest treated field to the sampling site was Ox-2B (see Map #3 in Appendix C). A wooded buffer exists between this field and the sampling site. The Imidan application took place from 10 to 10:30AM finishing when the temperature was 78°F.

Table 4. Surface Water Monitoring Results Pleasant River Watershed 7/17/04 Application of Imidan – water sample collected on 7/20/04								
Water Body	Site ID	Wind		Approx. treated field distances (feet)		Phosmet Results		
		Speed (mph)	Direction	Closest to site	Upwind of site	Water (ppb)	Drift card (ug)	Number of samples analyzed
Pleasant River main stem (near passive sampler)	14BPCS042	2	From SW	1000	1000	ND	NA	1 water

Results for Montegail Pond:

First Fungicide Application: The treated field closest to the Montegail Pond sampling sites was NM-5C. NM-8 was also treated 5/10/04 (see Map #4 in Appendix C). A couple of fields south of the pond, not shown on the map, were also treated. Applications were finished at 7:50AM when the temperature was 42°F. The samples were hand delivered to the laboratory 5/11/04. These samples were unlikely to show drift since the wind was not blowing from treated areas to the sampling sites.

Table 5. Surface Water Monitoring Results Montegail Pond 5/10/04 Application of Indar – water samples collected 5/10/04 at 6:20PM								
Water Body	Site ID	Wind		Approx. treated field distances (feet)		Fenbuconazole Results		
		Speed (mph)	Direction	Closest to site	Upwind of site	Water (ppb)	Drift card (ug)	Number of samples analyzed
South side next to pump	14BPCS064	3	From E	600?	None or far	ND	NA	1 water
Southwest side (small peninsula)	14BPCS065	3	From E	500	None or far	ND	NA	1 water

Second Fungicide Application: NM-5C was again treated, as were a couple of fields south of the pond. Spraying occurred for approximately 1 hour in the morning while the temperature rose from 42°F to 50°F. These samples were frozen and hand delivered to the laboratory on 6/18/04, and again, were unlikely to show drift given the wind direction

Table 6. Surface Water Monitoring Results Montegail Pond 6/1/04 Application of Indar – water samples collected 6/1/04 at 9:20PM								
Water Body	Site ID	Wind		Approx. treated field distances (feet)		Fenbuconazole Results		
		Speed (mph)	Direction	Closest to site	Upwind of site	Water (ppb)	Drift card (ug)	Number of samples analyzed
South side next to pump	14BPCS064	3-5	From SE	600?	?	ND	NA	1 water
Southwest side (small penin.)	14BPCS065	3-5	From SE	500	?	ND	NA	1 water

A sample of water was also collected from the two Montegail Pond sites on 6/4/04, however, there was a miscommunication and no pesticide applications occurred around this date. The samples were frozen and then ND for fenbuconazole.

First Insecticide Application: NM-5C and a couple fields south of the pond were treated. The samples in the table below were frozen and delivered to the laboratory 7/28/04.

Table 7. Surface Water Monitoring Results Montegail Pond 7/17 and 7/18/04 Application of Imidan – water samples collected 7/19/04								
Water Body	Site ID	Wind		Approx. treated field distances (feet)		Phosmet Results		
		Speed (mph)	Direction	Closest to site	Upwind of site	Water (ppb)	Drift card (ug)	Number of samples analyzed
South side (next to pump)	14BPCS064	0-3	From S	600?	?	ND	NA	1 water, 0 drift card
Southwest side (small peninsula)	14BPCS065	0-3	From S	500	?	ND	NA	1 water, 0 drift cards

Second Insecticide Application: The spraying of fields NM-5A and NM-8 was completed at 11:35AM when the temperature was 80°F. The part of field NM-8 that is closest to the lake was left untreated as a buffer. The samples in the table below were frozen and delivered to the laboratory 7/28/04. The positive detections of phosmet on drift cards is surprising given wind direction and voluntary buffer, but after speaking with the applicator, it is possible that a shift in wind directions could have occurred.

Table 8. Surface Water Monitoring Results Montegail Pond 7/21/04 Application of Imidan – samples collected 7/21/04 at 3:30PM								
Water Body	Site ID	Wind		Approx. treated field distances (feet)		Phosmet Results		
		Speed (mph)	Direction	Closest to site	Upwind of site	Water (ppb)	Drift card (ug)	Number of samples analyzed
South side (next to pump)	14BPCS064	2	From S	2000	?	ND	0.502	1 water, 1 drift card
Southwest side (small peninsula)	14BPCS065	2	From S	2500	?	ND	0.101 and ND	1 water, 2 drift cards

Results for Pretty Pond:

First fungicide application: On the morning of 5/9/04 Indar was applied to the fields north of Pretty Pond (see Map #5 in Appendix C), and a buffer along the pond was left untreated. The weather was overcast and 45°F. This sample was hand delivered to the laboratory 5/11/04. Drift to Pretty Pond was unlikely on this day since the wind was not blowing from the treated area toward the sampling site.

Table 9. Surface Water Monitoring Results 5/9/04 Application of Indar - water sample collected 5/10/04 at 8:15PM								
Water Body	Site ID	Wind		Approx. treated field distances (feet)		Fenbuconazole Results		
		Speed (mph)	Direction	Closest to site	Upwind of site	Water (ppb)	Drift card (ug)	Number of samples analyzed
Pretty Pond	14BPCS066	2-3	From SW	300	Far	ND	NA	1 water

Second fungicide application: This treatment was by helicopter very near the sampling site at field PP-1. However, winds were blowing from the pond to the treatment area, so as can be expected, the table below shows ND for the water sample that was collected that same day. Since Indar did not seem to be working well at other sites, 71 acres at this site was treated with Enable, which also has the active ingredient fenbuconazole, and Captan. The Enable application was completed at 2PM when the temperature was 50°F, and the Captan application, covering the same 71 acres, was completed at 4:30PM when the temperature was 59°F. The sample in the table below was frozen, and when the jar cracked, the sample was thawed in a freezer bag, transferred to another jar, and refrozen before being hand delivered to the laboratory on 6/18/04.

**Table 10. Surface Water Monitoring Results
 5/27/04 Application of Enable and Captan**

Water Body	Site ID	Wind		Approx. treated field distances (feet)		Fenbuconazole and Captan* Results		
		Speed (mph)	Direction	Closest to site	Upwind of site	Water (ppb)	Drift card (ug)	Number of samples analyzed
Pretty Pond	14BPCS066	1-3	From SE	100	Far	ND	NA	1 water

*MDL = 0.1ppb for water

Insecticide Application:

There were no sites near Pretty Pond that were sampled during the aerial application of Imidan.

Of all the 2004 sampling, no drift cards were analyzed for fenbuconazole (since samplers were not able to set up drift cards before Indar applications) or any pesticide other than phosmet. All water samples, however, were analyzed for the following suit of pesticides: captan, terbacil, azinphos-methyl, phosmet, fenbuconazole, hexazinone, chlorothalonil, malathion, and diazinon. Other than the positive detection of fenbuconazole (its duplicate was ND) and detections of phosmet, no other pesticide was detected except hexazinone. Eleven of nineteen water samples were positive for hexazinone ranging in concentrations from 0.11ppb to 0.52ppb. The two Pretty Pond samples and the two Pork Brook samples were all ND for hexazinone. Several of the Bog Brook Flowage samples were ND for hexazinone as was one of the Monetgail Pond water samples. Hexazinone is not aerially applied, and was not a focus of this study. For other studies relating to hexazinone in water please contact BPC.

4. Conclusions and Discussion:

Pesticide drift to natural resources such as rivers, streams, brooks, and lakes can and does sometimes occur at low levels based on this drift study and from BPC drift studies from the past few years. In 2004 five of nine sites detected low levels of pesticide drift. In 2003 pesticide drift was detected at approximately 1000 feet from the nearest application area at one site and at approximately 1500 feet from the nearest application area at another site. In 2001, pesticide drift was detected 270 feet to 1500 feet away from the nearest application areas. In 2000, pesticide drift was detected 100 feet to 5100 feet away depending on the particular sampling site. Details for previous years can be viewed in reports at the BPC main office, and some details are summarized below in Appendix A.

An important consideration to be made relating to this 2004 study involves frozen water samples. A laboratory study conducted by the University of Maine at Orono Food Chemical Safety Laboratory discovered that phosmet degrades when frozen in water. BPC staff collected large bottles of water from the Pleasant River to be used as part of the study. The water was divided up and spiked with varying concentrations of phosmet, frozen, and analyzed at different intervals. The results to this study will be written up in a report by the lab and hopefully

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published. The findings are very helpful to BPC, especially when evaluating the 2004 data included in this report, since almost all of the 2004 samples were frozen. This information will also be helpful when planning for future drift studies, although it is still unclear whether phosmet is preserved on frozen drift cards. Other BPC drift studies did not freeze samples.

BPC would like to thank the following: the blueberry growers, Cherryfield Foods, Inc. and Jasper Wyman and Sons, Inc. for providing pesticide application information and allowing access to, in some cases, private lands; to Jacob van de Sande, Joan McMurray, and Tracey Gamache of the Pleasant and Narraguagus River Watershed Councils, who donated time to conduct the sampling at the Bog Brook Flowage Sites, Pork Brook Sites, and the Pleasant River main stem site; Dr. Sherrie Sprangers and Ben Cox of the University of Maine at Machias who conducted most of the sampling at Montegail Pond and Pretty Pond; Lucner Charlestra of the University of Maine at Orono for POCIS work and for working with BPC to coordinate similar sampling sites for the POCIS and BPC's traditional sampling; Barry Mower, Mark Whiting, and David Courtemanch of the Maine Department of Environmental Protection for introducing BPC to Lucner and the idea of trying POCIS; Brian Perkins and Kelley Guthrie of the University of Maine Food Chemical Safety Laboratory for conducting a study on the effects of freezing water on phosmet concentrations; and the U.S. Environmental Protection Agency for continued funding.

BPC staff welcomes suggestions for future drift studies.

APPENDIX A. Six -Year Summary of BPC Drift Studies

1999 – A water sample from each of 13 sites was collected in July within 24 hours of aerial application of insecticides to the blueberry crops. Only hexazinone and terbacil were detected, two products that were not aerially applied. Two samples were collected on the main stem of the Narraguagus River, and three samples were collected from tributaries to the Narraguagus River. Three samples were collected from the main stem of the Pleasant River, and five samples were from tributaries to the Pleasant River. The complete 1999 Drift Report can be viewed at the BPC office.

2000 - Five sites in the Narraguagus River watershed and four sites in the Pleasant River watershed were assessed for the occurrence of off-target phosmet using a combination of drift cards and water samples. BPC attempted to use water sensitive cards that turn blue where water droplets hit them, but early morning dew made them useless. Effort was given to working with spray coordinators at Jasper Wyman and Sons, Inc. and Cherryfield Foods, Inc. to better select sites based on proximity to specific fields being treated with pesticides. Phosmet was detected in water samples at three sites ranging in concentration from 0.08 to 0.52 ppb. Phosmet was found on drift cards at four sites ranging in concentration from 0.675ug to 21.978ug. Four of the nine sites for 2000 showed positive detections of phosmet either in water or on drift cards. Hexazinone in water samples was the only other pesticide detected. The complete 2000 Drift Report can be viewed at the BPC office.

2001 – BPC continued to work with spray coordinators at Jasper Wyman and Sons, Inc. and Cherryfield Foods, Inc. to determine when and where aerial application of fungicides and insecticides were to occur. In 2001, an Isco auto sampler was used at a couple sites to automatically grab samples over an interval of time. Three sites in the Narraguagus River watershed were sampled for propiconazole and later in the summer for phosmet, and three sites in the Pleasant River watershed were sampled for chlorothalonil (trade name Bravo) and later in the summer for phosmet. Propiconazole was detected on drift cards, but not in water, at all three sites where it was applied. Chlorothalonil was detected in water at three of three sites where it was applied, and two of those sites also had a positive detection on a drift card. Overall, phosmet was found in water at two of seven sites and on drift cards at three of seven sites. Phosmet was found in water or on drift cards at five of seven sites. Hexazinone in water samples was the only other pesticide detected. The complete 2001 Drift Report can be viewed at the BPC office.

2002 – Not as many samples were collected due to BPC staffing changes. The few samples that were analyzed show phosmet in three water samples at Ingersol Stream Eastern Branch (a tributary of the Pleasant River) ranging in concentration from 0.199 to 0.815 ppb. All three of these samples were taken on the morning of 7/21/02. Two drift cards from the same site were

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non detect and one water sample from the Pleasant River (approximately two miles south of Crebo Flat) was non detect. The latitude and longitude of the Ingersol Stream site (44°45'44.0" and -67°53'01.6") and Pleasant River site (44°43'58.5" and -67°53'51.3") were recorded using a Garmin handheld GPS unit with the NAD83 datum.

2003 – Of the eight sampling sites for 2003, three sites had positive detections of phosmet either on drift cards or in the water or both. Propiconazole was not detected at any of the sites. Phosmet was found on two drift cards where Great Falls Branch intercepts Rt. 193, and phosmet was found on all four drift cards and in both water samples at the two sites on Montegail Pond. The complete 2003 Drift Report can be viewed at the BPC office, or online at www.thinkfirstspraylast.org.

2004 – See previous report.

The range of concentrations of phosmet detected in BPC drift studies from 2000 to 2004 appears in the table below. Sites and data from 1999 were not included because the methodology for that study was slightly different from the other four years. Data from 2004 POCIS is not included.

2000-2004		PHOSMET		
Site ID	Yrs. Sampled	Water (ppb)	Filter (ug)	
14BPCS035 Narr. W.Branch - Sprague Falls	'00	ND	ND	
14BPCS036* Great Falls Branch	'00, '01, '03	ND - 0.08	0.543 - 1.701	
14BPCS037 Schoodic Bk.	'00	ND	ND	
14BPCS042 Pleasant R. / boat launch	'02, '04**	ND	NA	
14BPCS043* Pleasant R. - Crebo	'00, '01, '03	ND - 0.253	ND	
14BPCS048* Crotch Camp Bk.	'00, '01	ND	ND - 0.152	
14BPCS051* Colonel Bk.	'00, '01, '03	ND - 0.1	0.731	
14BPCS052 Ingersoll Branch	'01, '02	ND - 0.815	ND	
14BPCS053 Taylor Bk.	'00	ND	ND	
14BPCS056 Jr. Grant Field	'00	0.52	21.978	
14BPCS057 Longfellow Bk./ Ethyl	'00	ND	ND - 0.688	

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Smith Pd.				
14BPCS058* Bog Stream	'00, '01	ND - 3.76	ND	
14BPCS059 Narr. R. main stem / Poplar Hill	'03	ND	ND	
14BPCS060* Narr. R main stem / gravel pit	'01	ND	3.495	
14BPCS061 West Ingersoll	'01	ND	ND	
14BPCS063 Long Pd.	'03	ND	NA	
14BPCS064 Montegail Pd. S.	'03, '04**	ND - 1.95	0.50 - 2.296	
14BPCS065 Montegail Pd. SW	'03, '04**	ND - 0.28	ND - 1.455	
14BPCS066 Pretty Pd.	'03, '04**	ND	NA	
14BPCS067* Bog Bk. Flowage / bridge	'04**	ND	ND	
05BPCS003 Pork Bk. NW	'04**	0.46	2.06	
05BPCS004 Pork Bk. SE	'04**	0.97	3.79	
14BPCS070 Bog Bk. Flowage downstream of bridge	'04**	NA	ND	
14BPCS071 Bog Brook Flowage upstream	'04**	ND	ND	
* = site received hit(s) of propaconazole, chlorothalonil or fenbuconazole **= water samples were frozen before UMO study showed phosmet degrading in frozen state				

APPENDIX B. 2004 Site Photos (Where Available)



Figure 1. Bog Brook Flowage 1, buffer



Figure 2. Bog Brook Flowage 1, drift card



Figure 3. Bog Brook Flowage 2, upstream of bridge, drift card on left and bouys for POCIS on right



Figure 4. Bog Brook Flowage 3, drift card



Figure 5. Pork Brook 1, northwest site, drift card

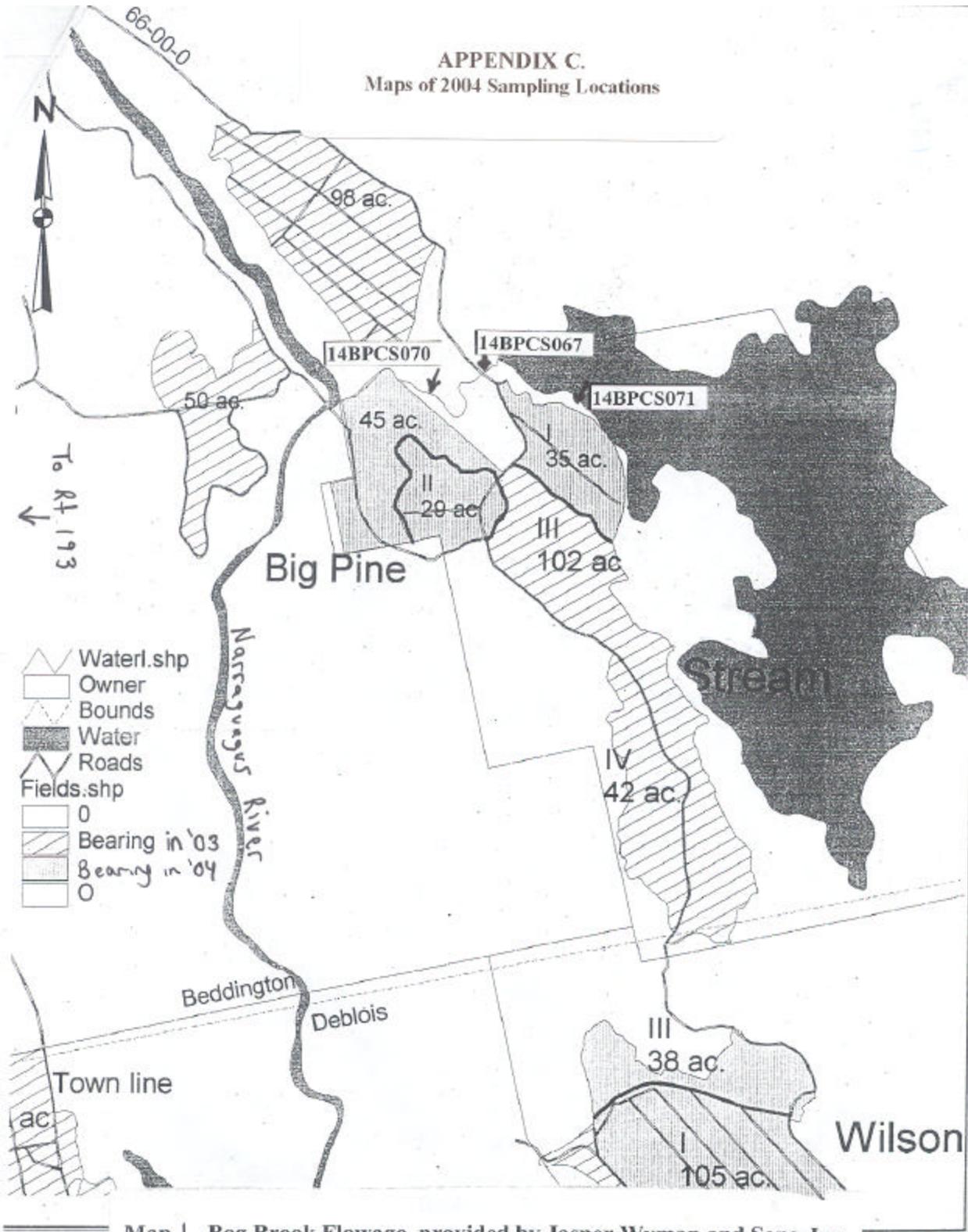


Figure 6. Pork Brook 2, southeast site drift card near POCIS

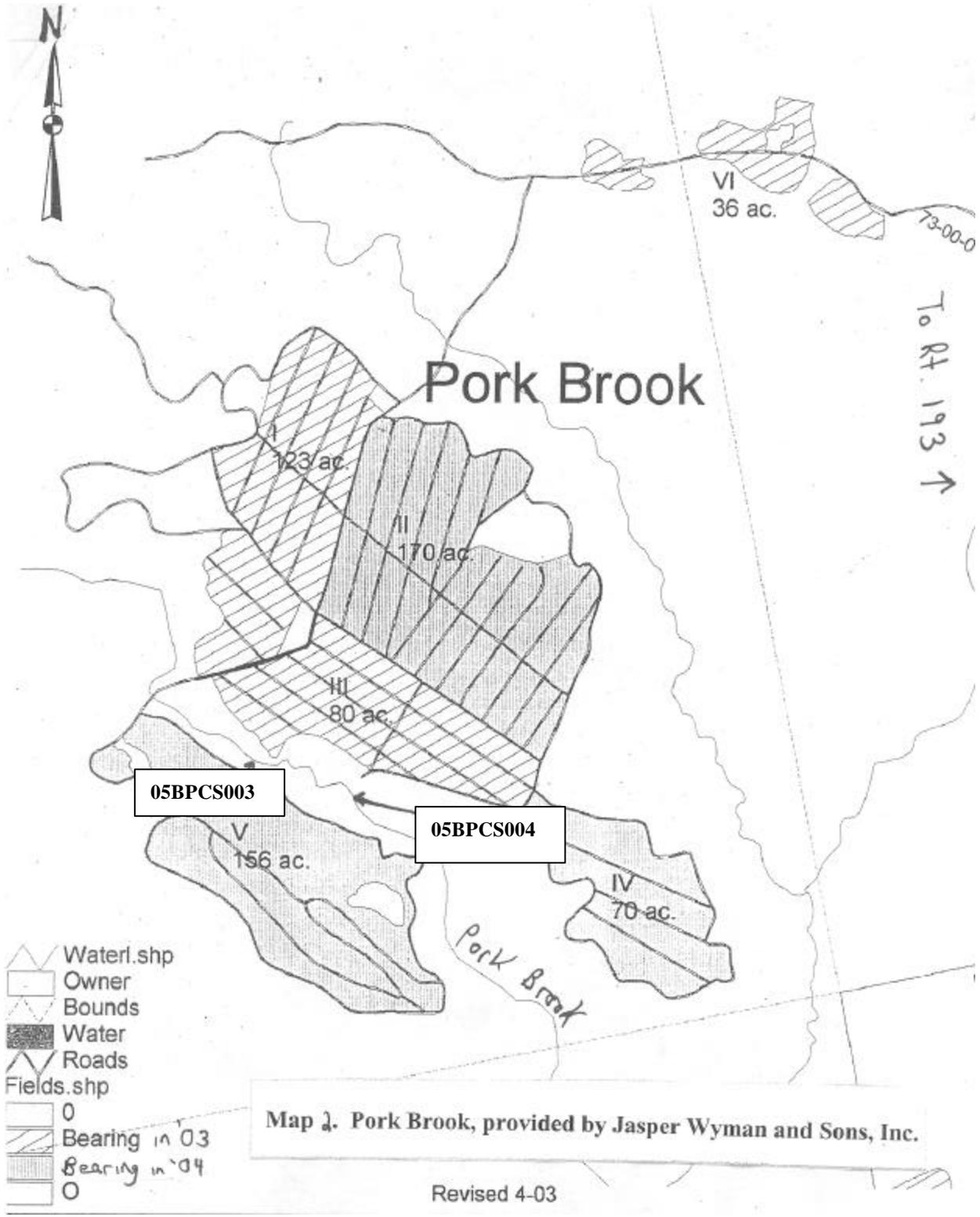


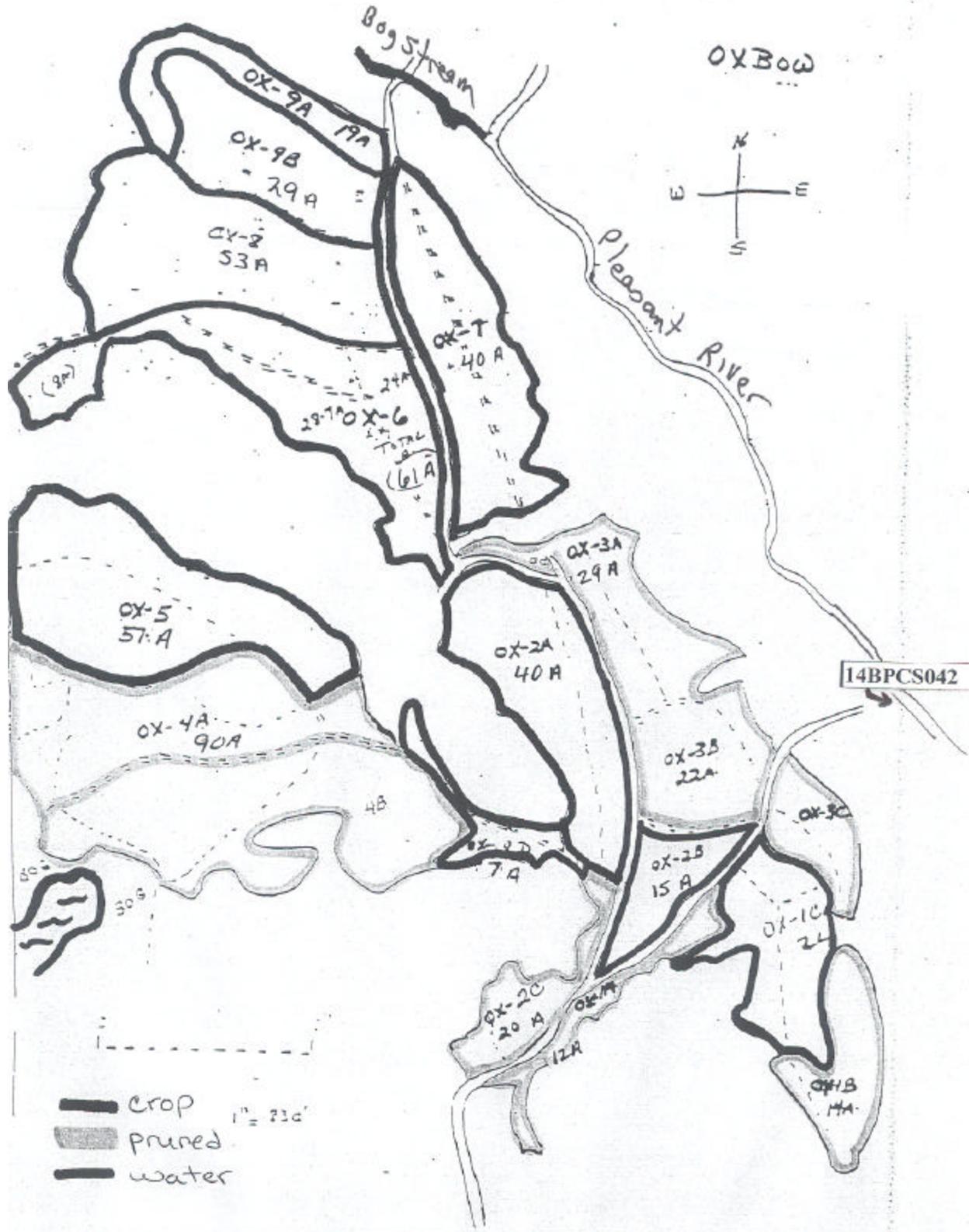
Figure 7. Pleasant River main stem, water sample collected only, near POCIS

APPENDIX C.
 Maps of 2004 Sampling Locations



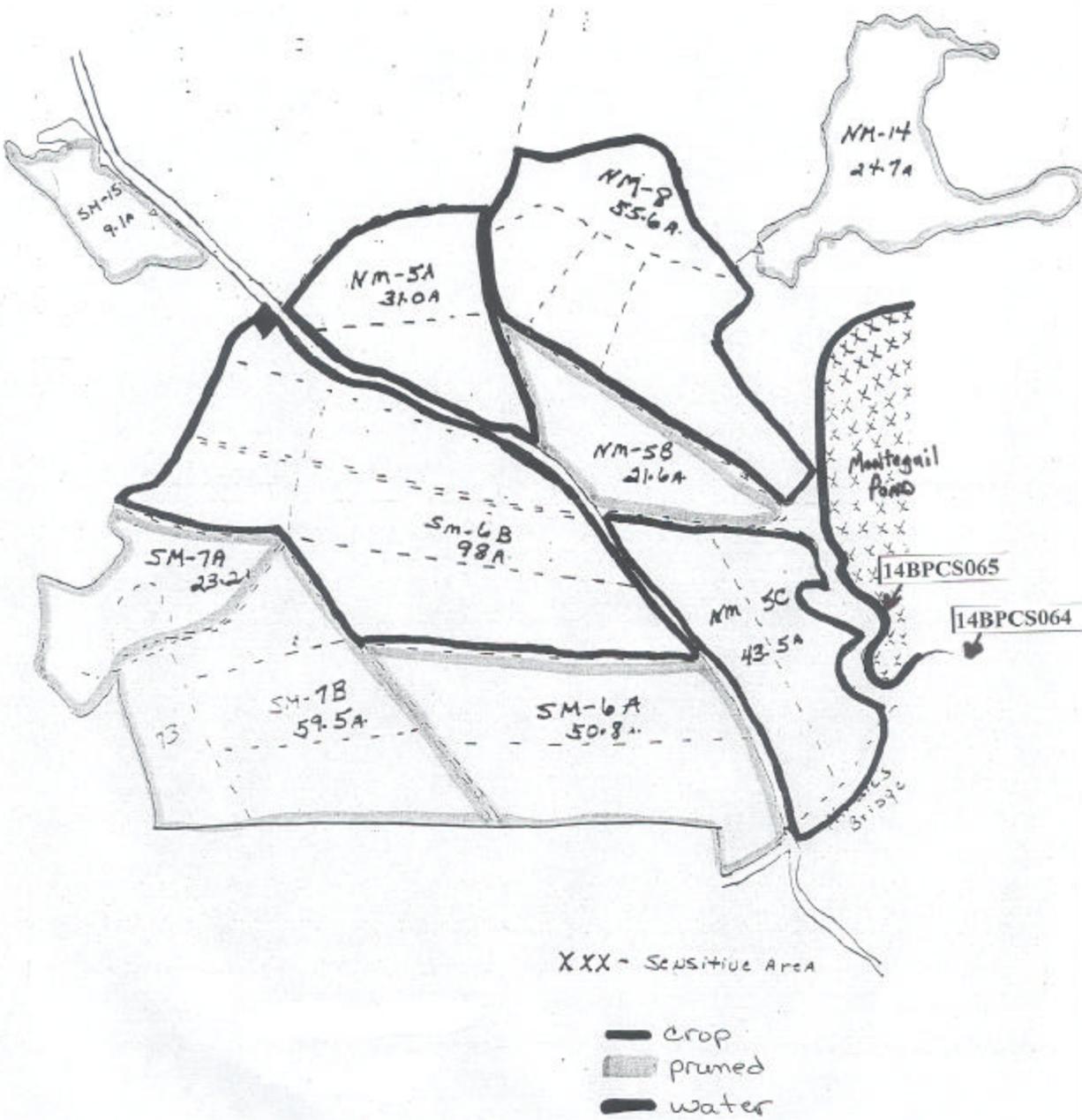
Map 1. Bog Brook Flowage, provided by Jasper Wyman and Sons, Inc.



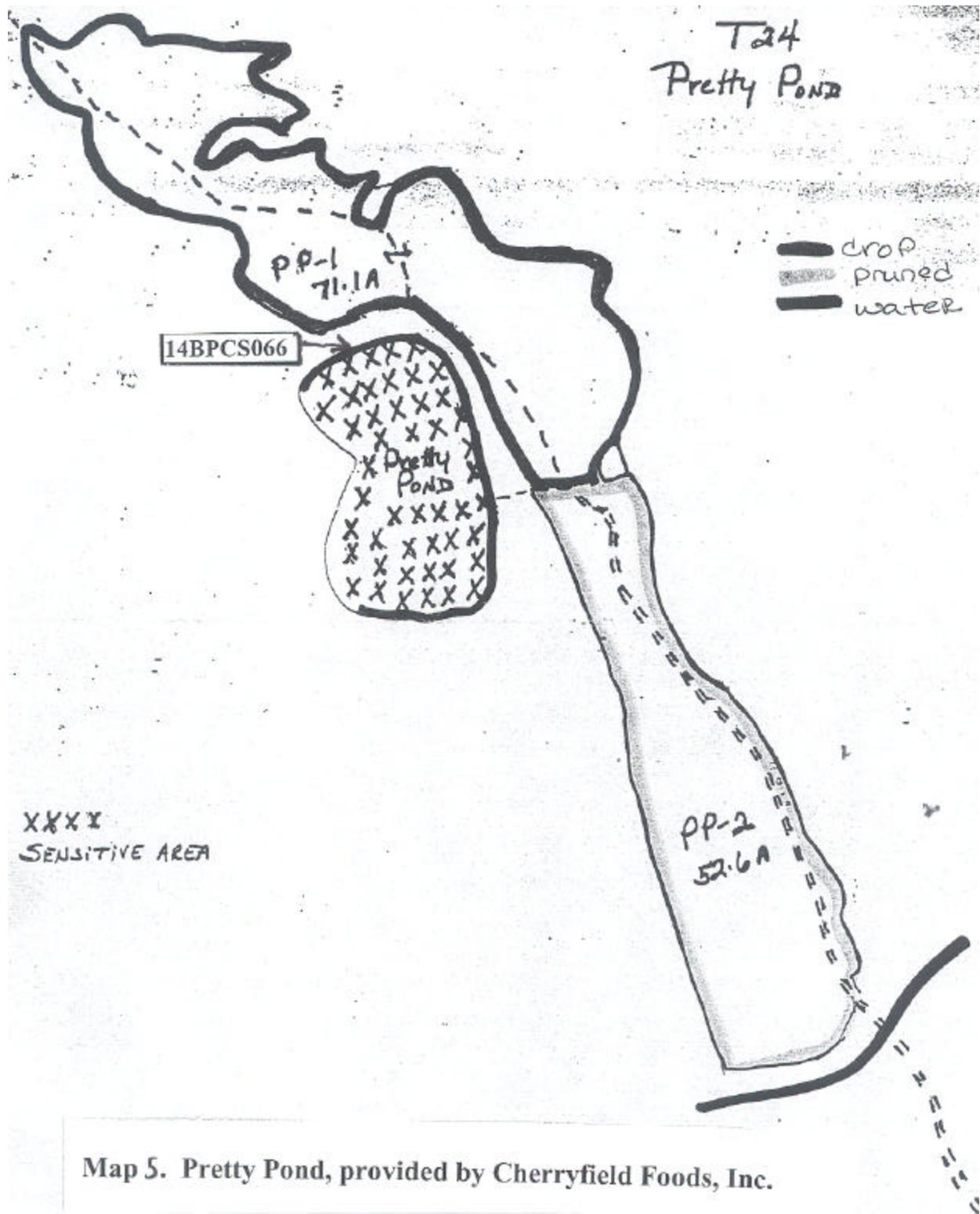


Map 3. Pleasant River, provided by Cherryfield Foods, Inc.

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Map 4. Montegail Pond, provided by Cherryfield Foods, Inc.



Map 5. Pretty Pond, provided by Cherryfield Foods, Inc.