ISSN 1070–1524

Baseline Data for Long-term Forest Vegetation Monitoring at Bear Brook Watershed in Maine

J. D. Eckhoff

G. B. Wiersma

Technical Bulletin 180 **April 2002**

MAINE AGRICULTURAL AND FOREST EXPERIMENT STATION
The University of Maine

Baseline Data for Long-term Forest Vegetation Monitoring at Bear Brook Watershed in Maine

J. D. Eckhoff
Post-Doctoral Research Associate

G. B. Wiersma
Professor of Forest Resources

Department of Forest Ecosystem Science
The University of Maine
Orono ME 04469

CONTENTS

TABLES

FIGURES

INTRODUCTION

In 1987, in response to concerns about the impacts of atmospheric deposition, commonly referred to as "acid rain," on forest ecosystems, the US Environmental Protection Agency (EPA) provided funds for the establishment of Bear Brook Watershed Research Site, Maine (BBWM), as a Watershed Manipulation Project (WMP) under the National Acid Precipitation Assessment Program (NAPAP). BBWM was established to identify atmospheric deposition impacts on surface waters and to quantify the major processes controlling surface water acidification under increased sulfur (S) and nitrogen (N) atmospheric deposition (Norton et al. 1992, 1994a; Uddameri et al. 1995). The initial research at BBWM also included assessing impacts of elevated loading of acidic or acidifying substances on forest soils (Rustad et al. 1996).

In more recent years research has begun to examine the impacts of atmospheric deposition on the forest vegetation at BBWM (e.g., Weber and Wiersma 1997; White et al. 1999). In 1996, long-term monitoring of the forest vegetation, employing the methodologies of the national Forest Health Monitoring (FHM) program (Tallent-Halsell 1994), was undertaken. The FHM program indicators used included forest mensuration, crown condition classification, and damage and catastrophic mortality assessment, which focused primarily on the woody vegetation; vegetation structure indicator, which included both woody and non-woody vegetation; and lichen communities indicator, which involved an in depth analysis of lichens at BBWM. Two additional indicators (not part of the FHM program), tree seed production and canopy gap fraction analysis, were also employed at BBWM. In-depth statistical analyses on the impacts of the manipulation, of increased levels of atmospheric S and N deposition, at BBWM on the forest vegetation and results on the efficacy of the FHM indicators are available in Eckhoff (2000).

The following report includes comprehensive information on the primary and meta forest vegetation data assembled from BBWM. This information represents the first in-depth inventory of the forest vegetation, both woody and non-woody in multiple strata, within the two watersheds initially established at BBWM, West Bear and East Bear, and also the areas adjacent to the east and west of these watersheds. (The adjacent areas are referred to as A&Y in this report.) For long-term monitoring of vegetation responses to the continued manipulations and/or the recovery of the ecosystems at BBWM, access to the vegetation baseline information contained within this report is essential.

This report archives an extensive baseline of the vegetation at BBWM. The information provided here can be used in combination with other research at BBWM; e.g., it can be combined with existing soils and hydrology data in developing watershed scale models. The information in this report may also be utilized in potential future projects; e.g., analyzing forest structure and habitat value of mature deciduous or coniferous forest types for neotropical migratory songbirds. Because of BBWM's ongoing function as a multidisciplinary research area, communication about and availability of information from past projects, such as the baseline data presented in this report, is very important.

METHODS

Research Site

Bear Brook Watershed in Maine (BBWM) is a paired-watershed research site located in eastern Maine, USA. (44º 52' N, 68º 06' W) in Hancock County, Township 28 Middle Division (Figure 1). BBWM is situated on the southeast slope of Lead Mountain (elevation 450 m) and encompasses the upper 210 m of the mountain. Several previously published articles are available with information on the climate of this region (e.g., Norton et al. 1994a, 1994b), the soils at BBWM (e.g., Fernandez et al. 1999; Norton et al. 1994a; Rustad et al. 1994, 1996; Uddameri et al. 1995), and stream chemistries at BBWM (e.g., Kahl et al. 1993; Norton et al. 1992). The status of the vegetation at BBWM will be described in this report.

West Bear watershed, 10.2 ha, and East Bear watershed, 10.7 ha, are contiguous watersheds, each of which is drained by a clear, low acid-neutralizing capacity, first-order stream (Kahl et al. 1993; Norton et al. 1992). As part of the original BBWM research design, a three-year calibration period (1987–1989) demonstrated that prior to the manipulation East and West Bear streams had similar hydrology and chemistry (Norton et al. 1992, 1994a). Manipulation of West Bear watershed, with bimonthly additions of granular dry ammonium sulfate at a rate of 118.8 kg $(NH_4)_2SO_4$ ha^{-1} yr^{-1} began November 14, 1989 (Kahl et al. 1993; Norton et al. 1992, 1994a). East Bear watershed is untreated and functions as a reference watershed (Kahl et al. 1993; Norton et al. 1992, 1994a; Uddameri et al. 1995).

The experimental loadings (28.8 kg S ha^{-1} yr^{-1} and 25.2 kg N ha^{-1} yr^{-1}) on West Bear watershed are two and three times the ambient wet-plus-estimated dry deposition of S and N, respec-

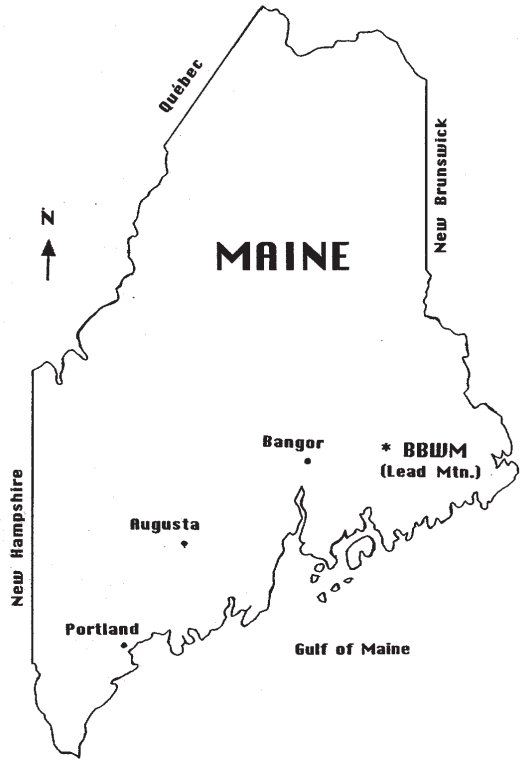


Figure 1. General location of Bear Brooks Watershed in Maine.

tively, for this region (Rustad et al. 1994). At these manipulation rates, S deposition is similar to the more heavily polluted regions of the USA, and N deposition is about one and a half times the highest estimated deposition in the USA (Fernandez et al. 1999).

Historically, the land in and around BBWM was used for timber production. The most recent harvesting activities occurred more than 45 years ago (Norton et al. 1994a); current vegetation is the result of natural regeneration. Other disturbances in this area included a greater than 50% defoliation of *Fagus grandifolia* Ehrh. (American beech) in 1994 by the *Lochmaeus manteo* (variable oakleaf caterpillar); more than 30% defoliation also occurred in 1995 (in Summary Reports 9 & 10 published by the Insect and Disease Management Division of the Maine Forest Service). In January of 1998, a severe ice storm, lasting six days, impacted the Northeast and New England states and southeastern Ontario and western Quebec, extending somewhat into New Brunswick and

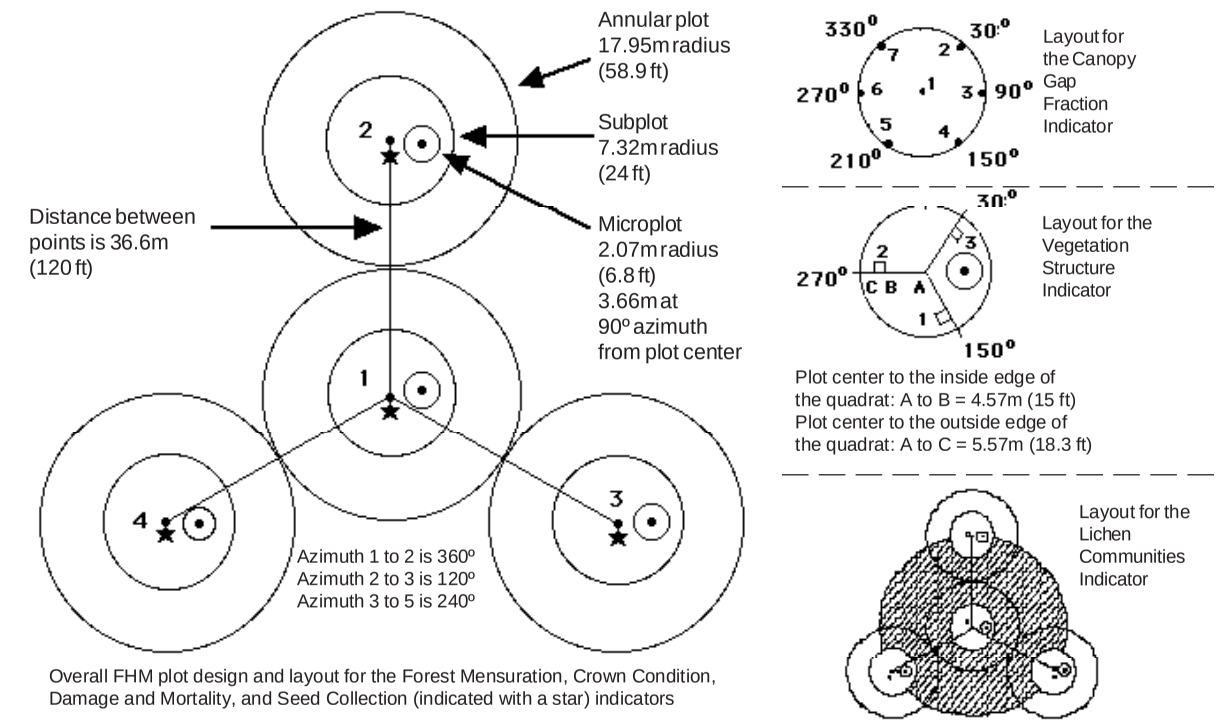
Nova Scotia. In Canada this was considered the most severe ice storm since 1955 (Canadian Forest Service 1999). Additional smaller scale ice storms occurred in the area of BBWM during the subsequent winter months. Damage to the vegetation at BBWM included broken tops and losses of major limbs on many of the trees (personal observation).

Plot Design

With only a few exceptions this vegetation-monitoring study at BBWM utilized the Forest Health Monitoring (FHM) program protocols as described in the *Forest Health Monitoring 1994 Field Methods Guide* (Tallent-Halsell 1994). The FHM plot design for the forest mensuration, crown condition, damage and catastrophic mortality assessment, and vegetation structure indicators involved a cluster of four 17.65-m, fixed-radius annular plots in a triangular design covering a total area of 0.4 ha (Figure 2).

The center of annular plot one was the center of the overall plot. Within each annular plot was nested a 7.32-m, fixed-radius subplot. In the ground at each subplot center was a wooden stake (painted orange) with a metal tag attached indicating the plot number; two pairs of white and blue flagging were also tied on the nearest tree. The four subplots covered 0.066 ha. Within each nested subplot was a 2.07-m, fixed-radius microplot. The microplot was located 90º and 3.66 m east of the subplot center, unless the subplot was inverted (this will be discussed further in the next section on plot layout) in which case the microplot was located 270º and 3.66 m west of the subplot center. Each microplot was marked with a wooden stake (painted orange) and one pair of white and blue flagging was tied on the nearest tree. Four microplots (from the four subplots) covered 0.00533 ha.

The FHM plot design for the vegetation structure indicator included three 1-m^2 quadrats within each subplot (Figure 2). The 12 1-m^2 quadrats combined (three in each of the four subplots) covered 0.0012 ha. The three quadrats were each located 4.57 m from the subplot center, the first at 30º, the second at 150º, and the third at 270º. If the plot was inverted then the first quadrat was located at 210º, the second at 330º, and the third at 90º. (Note: the second quadrats in plots W-10-1 and W-10-2 were inadvertently established on the left side of a line extending from the plot center, this was the opposite side from the actual program method.) The four corners of each quadrat were marked with a white flag stuck into the ground.



Overall FHM plot design and layout for the Forest Mensuration, Crown Condition, Damage and Mortality, and Seed Collection (indicated with a star) indicators

Figure 2. Plot design for vegetation data collection in the simulated FHM plots at Bear Brook Watershed in Maine. Information adapted from Tallent-Hassell (1994).

The FHM plot design for the lichen communities indicator was a 36.6-m-radius circular plot (Figure 2). It was centered in the middle of subplot one, excluding the areas inside the four subplot boundaries. The lichen plot area covered 0.377 ha.

Tree seed production and canopy gap analysis indicators were not part of the FHM program. However, the plot designs for collecting these indicators' data were integrated into the existing FHM plot design. For the tree seed production indicator, one seed trap was placed 0.5 m south of each subplot center (Figure 2). If the plot was inverted then the basket was 0.5 m north of the subplot center. The plot size (areas of each basket opening) was 615 cm^2 and plot area for each basket/subplot was 0.00000615 ha. The total plot area for four baskets/cluster-plot was 0.0000246 ha.

The canopy gap fraction indicator included six measurements from around the perimeter of the subplot (7.3 m from the subplot center) and one at the subplot center for a total of seven (Figure 2). The locations around the perimeter were at 30º, 90º, 150º, 210º, 270º, and 330º; these were each marked with a blue flag stuck into the ground. (These were the same locations that were originally used for the FHM photosynthetically active radiation [PAR] indicator that was no longer in use in the FHM program.)

Plot Layout

The vegetation-monitoring plots in this study at BBWM were established in 1996. Sampling plots were laid out in a systematic manner to establish as many cluster-plots as possible within East Bear and West Bear watersheds. Ten FHM design cluster-plots were established in each of these two watersheds (Figure 3). An additional five cluster-plots were established east of East Bear, these are referred to as the "A" plots, and an additional five cluster-plots were established west of West Bear, these are referred to as the "Y" plots. These monitoring plots were added as a response to the lack of availability of vegetation baseline data from when BBWM was established in 1987. After comparing soil and vegetation characteristics of the A and Y plots, it was decided that the two areas would be combined in the statistical analyses; they are referred to as "A&Y." Tables A-1 and A-2 in the appendix include information on the locations of all the plots relative to the grid markers at BBWM and with global positioning system (GPS).

As was stated previously, an attempt was made to maximize the number of plots within East and West Bear watersheds, as a result some of this study's plots were inverted and annular plot two was directly south of annular plot one. This layout does not follow the FHM guidelines that all cluster-plots be oriented with annular plot

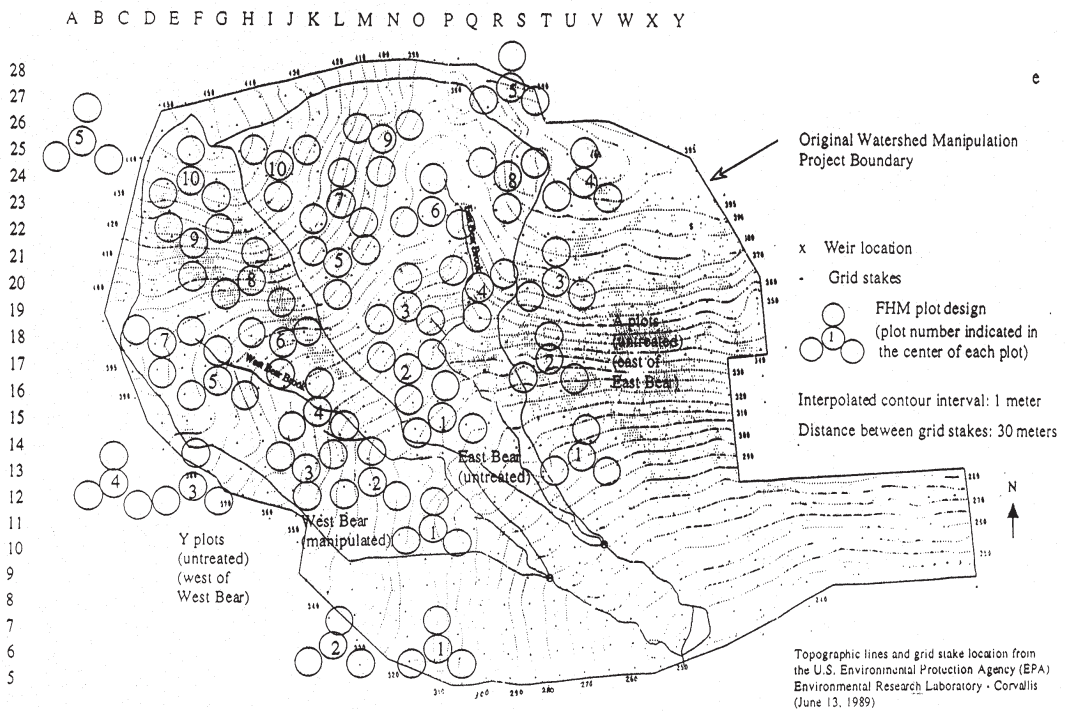


Figure 3. Layout of the study plots at Bear Book Watershed in Maine.

two directly north of annular plot one. In the event that the cluster-plot was inverted, the locations (azimuths) of the microplots, vegetation structure plots, and seed baskets were also "inverted."

BBWM was initially established in 1987 using a corrected declination of 19º to the west of true north. The grid post markers in the field reflected the corrected declination, as did the EPA GIS database for BBWM. In keeping with this, the vegetation plot layout and all the measurements recorded were also done with the same corrected declination. (This was an exception to the method outlined in the FHM program, which stipulated that all compass readings be taken from magnetic north and not corrected for declination.)

Survey Methods

FHM forest mensuration, crown condition, and damage and catastrophic mortality indicators

FHM forest mensuration, crown condition, and damage and mortality indicator guidelines in the Forest Health Monitoring 1994 Field Methods Guide (Tallent-Halsell 1994) were used to collect data in the subplots and microplots on the trees, saplings, and seedlings (Table 1). As was stated in the plot layout section, some of the cluster-plots in East Bear and West Bear were inverted. However, for the forest mensuration, crown condition classifica-

Table 1. FHM vegetation size categories and their corresponding plot size and area.

Indicator	Vegetation size category	Plot size	Plot area
[1]tree	= 12.7 cm dbh	7.3-m radius subplot	0.0166 ha
[1]sapling	< 12.7 cm dbh and = 2.54 cm dbh	2.07-m radius microplot	0.001333 ha
[1]seedling	< 2.54 cm dbh and = 30 cm height	2.07-m radius microplot	0.001333 ha
[1]understory vegetation	(includes seedlings < 30 cm height)	2.07-m radius microplot	0.001333 ha
[1]vegetation structure	(all the vegetation)	3 1-m^2 quadrat	0.0003 ha
[1]lichens	macrolichen species on woody plants only	36.6-m radius macroplot	0.377 ha
tree seeds	(all the tree species)	14 cm radius basket	0.00000615 ha

[1]FHM indicator.
Information adapted from Tallent-Halsell (1994).

tion, and damage and catastrophic mortality indicators, all trees and saplings measurements were recorded facing north and proceeding clockwise around the subplot or microplot regardless of the plot orientation.

Forest mensuration measurements were collected at BBWM from July through August 1997. Within the subplots the following measurements were recorded for all live trees: species, location (distance and azimuth from plot center), diameter breast height (dbh), and crown class. Species (if identifiable), location, and dbh were also recorded for all snags within the subplots. Crown condition classification and damages measurements on the trees in the subplots were recorded from September through October 1997. Due to time constraints, live crown ratio was the only crown condition FHM program variable measured for the trees. Crown vigor was recorded for the trees; this was not part of the FHM program for tree measurements but it was included for saplings (and seedlings), thus the same criteria for saplings was used for the trees. Damage and mortality indicator measurements included location, type, and severity of damages (limited to three per tree) (Table 2). Table A-3 in the appendix includes the raw data collected on the trees at BBWM for the forest mensuration, crown condition classification, and damage and mortality indicators. Identification of the FHM program tree species codes is available in Table 4. Identification of the FHM damage indicator codes is available in Table 2.

Within the microplots, measurements were recorded on all live saplings and seedlings. Forest mensuration measurements recorded for saplings include species, location (distance and azimuth from plot center), dbh, and crown class. Crown condition classification measurements included live crown ratio and vigor. Damage and mortality measurements included location, type, and severity of damages. These measurements were limited to three per sapling. Table A-4 in the appendix includes the raw data collected on the saplings at BBWM for the forest mensuration, crown condition classification, and damage and mortality indicators.

The forest mensuration measurements for seedlings included species and crown class. The only crown condition classification measurement was crown vigor. The number of seedlings within each species/class/vigor group was counted. Table A-5 in the appendix includes all the raw data collected on the seedlings. Also within the microplot, understory vegetation abundance was recorded (5% increments) for mosses, lichens, ferns, herbs, shrubs, and tree seedlings. Table A-6 in the appendix includes the raw data collected on the understory.

Table 2. FHM damage and mortality indicator: location on the tree (prioritized beginning with roots & stump), damage signs and symptoms (in order of priority), and minimum thresholds (shaded areas indicate that this location and damage sign is not a valid combination)

DAMAGE SIGN OR SYMPTOM listed in decreasing priority (FHM code #)	LOCATION ON THE TREE (FHM code #) 1st priority → last priority								
	roots & stump (1)	roots & lower bole (2)	lower bole (3)	lower & upper bole (4)	upper bole (5)	crownstem (6)	branches (7)	buds & shoots (8)	foliage (9)
canker (1)									
conks, fruiting bodies, & decay (2)	no minimum threshold								
open wounds (3)									
resinosis or gummosis (4)									
broken bole or roots > 0.9m (3') from bole (11)	no minimum threshold								
brooms on roots or bole (12)	no minimum threshold								
broken or dead roots < 0.9m (3') from bole (13)	< 20% affected								
loss of apical dominance (21)						no minimum threshold			
broken or dead branches (22)							< 20% affected		
excessive branching or brooms (23)							< 20% affected		
damaged foliage or shoots (24)								30% of the buds, shoots or foliage < 50% affected	
discoloration of foliage (25)									30% foliage <50% affected
other (31)	no minimum threshold			no minimum threshold		no minimum threshold		no minimum threshold	

(Severity codes vary by type of damage; for most damages 20-29% affected = code 2, 30-39% affected = code 3, etc.; other damages are '0' regardless of severity)

Information adapted from Tallent-Halsell 1994

Table 3. Seed dispersal dates for the tree species at Bear Brook Watershed, Maine.

Species Latin name	Common Name	Seed Dispersal Dates	Data Source
Abies balsamea	balsam fir	Mid-Sept.	Little and DeLisle 1962
Acer pensylvanicum	striped maple	Oct.–Nov. April–July	USDA Forest Service 1948 Sudworth 1900
Acer rubrum	red maple		USDA Forest Service 1948
Acer saccharum	sugar maple	Oct.–Dec.	Gabriel 1969 Godman 1965 USDA Forest Service 1948
Acer spicatum	mountain maple	do	Piatnitsky 1934 USDA Forest Service 1948
Betula alleghaniensis	yellow birch	Sept.–Spring	Fernald 1950 Marquis 1963 Van Dersal 1938
Betula populifolia	gray birch	Oct.–Midwinter	USDA Forest Service 1948
Fagus grandifolia	American beech	After frost	Radford et al. 1964 Trimble 1967 USDA Forest Service 1948
Fraxinus americana	white ash	Sept.–Dec.	Petrides 1958 USDA Forest Service 1948
Picea rubens	red spruce	Oct.–March	Heinselman 1965
Pinus strobus	white pine		
Quercus rubra	northern red oak	late Aug.– early Dec.	Sander 1965 USDA Forest Service 1948
Tsuga canadensis	eastern hemlock	Sept. to winter	Frothingham Green 1939 Hough 1947 USDA Forest Service 1948

Information from *Seeds of Woody Plants in the United States* (USDA Forest Service 1974).

For each cluster-plot (set of four subplots), one site tree was selected. Forest mensuration, crown condition classification, and damages measurements similar to those recorded for the trees in the subplots were recorded for the site trees. However, basal area, age, crown density, dieback, and diameter, and foliage transparency were also recorded. Table A-7 in the appendix includes the raw data collected on the site trees at BBWM.

Table 4. Tree, shrub, and liana species recorded at Bear Brook Watershed in Maine in 1997.

Family name	Genus and species	Species' code[1]	Common name
Trees			
ACERACEAE (maple family)			
	Acer pensylvanicum L.	315	striped maple, moosemaple
	Acer rubrum L.	316	red maple
	Acer saccharum Marshall.	318	sugar maple
BETULACEAE (birch family)			
	Betula alleghaniensis Britton	371	yellow birch
	**Betula papyrifera* Marshall.	375	paper or white birch
	Betula populifolia Marshall.	379	gray birch
FAGACEAE (beech family)			
	Fagus grandifolia Ehrh.	531	American beech
	Quercus rubra L.	833	northern red oak
OLEACEAE (olive family)			
	Fraxinus americana L.	541	white ash
PINACEAE (pine family)			
	Abies balsamea (L.) Miller	012	balsam fir
	Picea rubens Sarg.	097	red spruce
	Pinus strobus L.	129	Eastern white pine
	Tsuga canadensis (L.) Carriere	261	Eastern hemlock
ROSACEAE (rose family)			
	Prunus serotina Ehrh.	762	black cherry
	Prunus virginiana L.	763	choke-cherry
	Sorbus americana Marshall	935	American mountain-ash

Family name	Genus and species	Common name
Shrubs		
ANACARDIACEAE (cashew family)		
	**Rhus glabra* L.	smooth sumac
BETULACEAE (birch family)		
	**Corylus americana* Walter.	American hazel-nut
CAPRIFOLIACEAE (honeysuckle family)		
	Diervilla lonicera Miller.	bush-honeysuckle
	Lonicera canadensis Marshall.	fly-honeysuckle
	Viburnum acerifolium L.	dockmackie; flowering maple
	Viburnum alnifolium Marshall.	hobble-bush; moosewood
CORNACEAE (dogwood family)		
	Cornus alternifolia L.f.	alternate-leaved dogwood
ERICACEAE (heath family)		
	Vaccinium angustifolium Aiton.	blueberry
	Gaultheria procumbens L.	winterberry
GROSSULARIACEAE (gooseberry family)		
	Ribes glandulosum Grauer.	skunk-current
ROSACEAE (rose family)		
	Rubus allegheniensis T.C. Porter.	common blackberry
	Rubus idaeus L.	red raspberry

Table 4. Continued.

Family name	Genus and species	Common name
Lianas		
CONVOLVULACEAE (morning-glory family)		
	**Convolvulus* sp.	bindweed

[1]FHM program: Eastern U.S. tree species codes.
*Species within the watershed or adjacent areas which did not occur in the study plots.
The nomenclature above is that of Gleason & Cronquist (1991).

Other site descriptors assessed at BBWM included stand origin, land use, disturbance history, forest-type, and stand size. Forest-type groups, referred to in the FHM program as "condition classes," at BBWM were determined primarily from the overstory vegetation, with consideration of the understory component, as per the FHM protocol. All the tree species associated with a given forest-type did not need to be present for that specific forest-type to apply. The forest-type groups used were recognized by the Society of American Foresters (Eyre 1980). There were two stand size categories, sawtimber and poletimber, which were based on the dbh of the live, non-overtopped trees. Sawtimber indicated that 50% or more of the trees within a plot met a minimum dbh requirement depending on whether the trees were deciduous, ≥ 28 cm dbh, or coniferous, ≥ 23 cm dbh. Poletimber indicated that more than 50% of the trees are 12.7 ≥ 28 cm dbh if they were deciduous or 12.7 ≥ 23 cm dbh if they were coniferous (Tallent-Halsell 1994). Table A-8 in the appendix includes information on the forest-types and stand sizes, by subplot, recorded at BBWM in 1997.

FHM vegetation structure indicator

Vegetation structure measurements were recorded between mid-June and August of 1997. FHM vegetation structure indicator guidelines (Tallent-Halsell 1994) were used to record measurements on all the plant species present and their abundances within 1-m^2 quadrats. FHM program measurements were recorded to nearest 1%. For this study only the first 10% was assessed as 1% increments (1, 2, … 10), from there up the assessment was based on 5% increments with the exception of a "99%" (10, 15, 20, … 95, 99, 100). Classifications of "rare" and "trace" were also used in this study. Rare referred to a single individual whose cover was > 0.25% of the quadrat. Trace referred to several individuals whose abundances combined made up > 0.05% of the quadrat, or one individual that was large enough to be close to 0.05% of the quadrat. Table A-

9 in the appendix includes the raw vegetation structure indicator data collected at BBWM.

Frames for the 1-m^2 quadrats used with the vegetation structure indicator were constructed out of PVC pipes with elbow joints at the corners. The inside dimensions of the frame measured 1 m. The frame was easily assembled for use in the field and disassembled for transport. The pipes were painted with alternating black and white 10-cm-wide bands to facilitate determining abundances. Cutout cardboard disks, which could be moved around within the frame, representing 1%, 5%, and 10% were also used to facilitate consistency in determining abundances. The vertical distribution for measurements was subdivided into four strata: 0–0.6 m (0–2') above ground, 0.6–1.8m (2–6') above ground, 1.8–4.9 m (6–16') above ground, and >4.9 m (>16') above ground. A height pole was used to assess height levels and quadrat boundaries up through the third strata. Ocular estimates were used to determine quadrat boundaries in the fourth strata.

FHM lichen communities indicator

Lichen data was collected between mid-July and early August in 1996. FHM lichen communities indicator guidelines (Tallent-Halsell 1994) were used to collect data on the presence and abundance of fruticose and foliose macrolichens on woody plants at BBWM. The lichens were identified and abundances recorded in a walking reconnaissance within a 0.38-ha circular plot (36.6 m) centered in the middle of subplot 1 and excluding the four subplots (Table 1). The abundance codes included (1) rare (<3 individuals), (2) uncommon (4–10 individuals), (3) common (>10 individuals but < one-half of the boles and branches had that species present), and (4) abundant (>10 individuals and > one-half of the boles and branches had that species present).

Samples of all the different lichen species found in each plot were collected and brought back to a lab at the University of Maine for positive identification; this procedure was not required in the FHM program that requires only unknown samples to be collected. The field collection and initial identification of the lichens collected at BBWM was done by Dr. Lev Biazrov, a visiting lichenologist from the Institute of Ecology and Evolution, Russian Academy of Sciences in Moscow. Verification of the BBWM lichen samples was done by Dr. James Hinds from the University of Maine Department of Biological Sciences and Patricia Hinds of Orono, Maine. Table A-10 in the appendix includes the raw lichen communities indicator data collected at BBWM in 1996.

Tree seed production indicator

For the tree seed analysis, tree seed collection bags (seed traps) were emptied semiannually for the first two years (1997 and 1998): one collection in mid-summer and one early the following spring. The mid-summer collection helped distinguish between *Acer rubrum* L. (red maple) seeds, which were produced in the early summer, and *Acer saccharum* Marshall (sugar maple) seeds, which were produced in the early fall (Table 3). The early spring or final collection each year accounted for over-winter seed production, primarily of *Betula alleghaniensis* Britton (yellow birch). All the litter within each seed collection bag was collected in the field and brought back to the lab where the tree seeds were sorted out, counted, and recorded by species/subplot. Tables A-11 and A-12 in the appendix include the raw tree seed collection data from BBWM in 1997 and 1998, respectively.

The frame or basket used for the tree seed collection was an 80-cm-tall, 14-cm-radius (at the top) wire basket (garden tomato cage) (Figure 4.). A metal tag indicating the plot number was attached to the basket frame. The bag that hung inside the basket was constructed from nylon mesh fabric that was cut in strips 100 cm x 40.3 cm. The strips were folded over (final size is 50 cm x 40.3 cm) and machine stitched in a J shape to form a bag, open at the top, with rounded corners at the bottom. The bag was placed inside the top of the basket frame with several cm overhanging the sides of the top of the frame. The overhang of the bag was secured around the upper rim of the basket with six wooden clothespins. The legs of the basket were bent outward at the time that the frame was put into the ground in the field. In areas with shallow soils, the legs were bent further and secured into the ground with metal stakes and rocks. The basket frame held the collection bag about 30 to 40 cm above the ground level.

Tree canopy gap fraction indicator

Tree canopy gap fraction indicator measurements were recorded between August 15 and September 8 in 1996 and between August 18 and September 17 in 1997. The measurements were recorded using a Li-Cor LAI-2000™ plant canopy analyzer using two control units, two optical sensors, and two 180º view caps. The operating mode used was "remote," which means that one control unit and sensor were stationary, set up in a clearing, and dedicated to logging "A" readings (above canopy) and the second control unit and sensor were mobile, taken to the plots, and dedicated to logging "B" readings (below canopy). The two sensors were calibrated at the

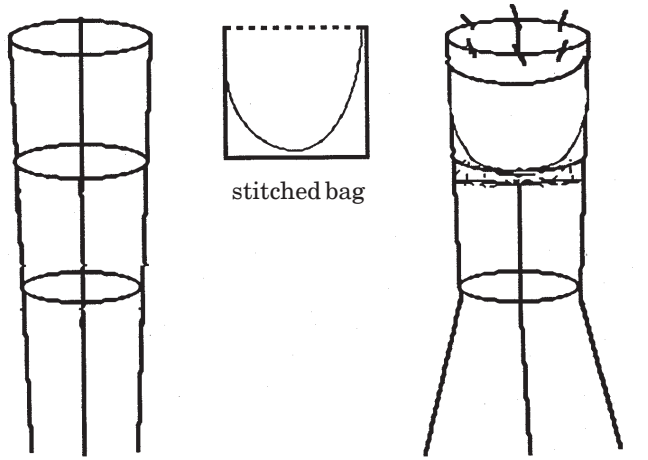


Figure 4. Seed trap parts and finished assembly. Design adapted from the Holt Research Forestr, Arrowsic, Maine (Witham et al. 1993).

beginning of each use (to ensure that they gave the same readings when exposed to the same conditions).

Both the stationary and the mobile sensors were always held on the level, measurements were always recorded facing north, and 180° view caps were used on both sensors to reduce interference. The stationary sensor was mounted on a tripod placed somewhat near the southern edge of the lower parking area, adjacent to the gate. To reduce the chance of accidental interference with the unit, the parking area was heavily flagged on the days that readings were recorded. The mobile unit was held at approximately 1.2 m above ground. Care was taken to make sure that no obstruction was directly on top of the sensor when collecting data at the designated collection points within the subplots. For example, a leaf directly above the sensor would be moved out of the way. Measurements were only recorded on clear days or on very overcast days.

LAI-2000 measurements, referred to as the proportion of visible sky or tree canopy gap fraction, are dimensionless, but can be thought of as the proportion of m^2 foliage area/m^2 ground area. They are expressed as a proportion, the values range from zero (no sky visible to the sensor) to one (no foliage visible to the sensor) (LI-COR

1992). The stationary and remote LAI-2000 units both measured the attenuation of diffuse non-intercepted (DIFN) sky radiation at five zenith angles simultaneously; the angles were 0–13º, 16–26º, 32–43º, 47–58º, and 61–74º. For the analyses in this project, the transmittance values from the four subplots were averaged to provide one cluster-plot value. All analyses were done first using all five angles (more commonly referred to as rings) and then using three angles, masking the 47º to 58º angles and 61º to 74º angles. The masking was done to compensate for the relatively small opening of the parking lot and the fact that the nearest "visible" trees were not quite three tree heights away from the stationary unit. When the largest angle is masked the minimum plot size decreases to 1.6 times the canopy height, masking the two largest angles decreases to the minimum plot size to 0.8 or essentially one times the canopy height. Tables A-13 and A-14 in the appendix include the raw Li-Cor 2000™ data (using five rings and three rings) from East Bear and West Bear in 1996 and East Bear, West Bear, and A&Y in 1997, respectively.

Statistical Analysis

The plot design for this study involved "cluster-plots." Hence, as a consequence of the cluster-plot design the data were analyzed by cluster-plots (generally referred simply to as "plots"). The forest-type analyses, however, were done both by cluster-plots, which is the standard FHM protocol, and by subplots. The use of subplots provided a smaller scale, higher resolution analysis and a more in-depth survey of the forest communities present at BBWM. GPS was used to locate the plot centers on the ground. This information was used in conjunction with Systat™ to generate forest-type maps and to plot the distributions of the damages recorded on the trees. Stratifying the plots (sampling units) by forest-types was used in the analyses to decrease the variance of the estimate of the population mean. By stratifying, the total variance was smaller and the precision with which the means were measured was increased.

Statistical analyses, including ANOVA and contingency tables, were done using the SAS program JMP™. Biodiversity analyses of the lichen community and vegetation structure compositions involved using permutation tests run in Microsoft Excel™; these tests evaluate the probability of occurrence. For more detailed statistical analyses see Eckhoff (2000).

RESULTS

Overall Species Composition

Table 4 contains a list of 16 tree, 12 shrub, and one liana species recorded within the forested watersheds at BBWM. Similarly, Table 5 contains a list of 29 forb and nine fern species plus grass and introduced plant species within the closed-forest-canopy habitats of BBWM. (Additional species observed in the open-canopy areas near the wiers and in the summit areas not included here.) Most of the species on these lists were found within the forest mensuration or vegetation structure plots; a few did not occur in any of the plots but were present on the site. Samples were collected, identified, and herbarium mounted for all the plant species on these lists. Table 6 contains a list of the 65 lichen species recorded at BBWM. A total of 570 lichen samples was collected, identified, mounted, and donated by this project to the herbarium at the University of Maine, Orono.

The major dominant tree species, in terms of number of trees recorded, in all three treatment areas were *Acer pensylvanicum* L. (striped maple), *A. rubrum*, *A. saccharum*, *B. alleghaniensis*, *F. grandifolia*, and *Picea rubens* Sarg. (red spruce) (Table 7). These species constituted 99% of all the live trees in West Bear, 98% in East Bear, and 96% in A&Y (Table 8). The most abundant of the major dominant tree species were *P. rubens*, representing from 30% to 56% of the live trees in the three treatment areas, and *F. grandifolia*, representing from 19% to 38% of the live trees. Two plots in West Bear (W-5 and W-7) had a large number of *A. saccharum*. Two plots in East Bear (E-5 and E-10) and two plots in A&Y (A&Y-8 and A&Y-9) had large numbers of *A. rubrum*. *Acer rubrum* was the only major dominant tree species with a significant difference (P-value 0.03) between the treatment areas in the number of trees per plot; East Bear had significantly more *A. rubrum* trees than West Bear. However, when the treatment areas at BBWM were stratified by forest types, as discussed in the next section, there were no significant differences between the treatment areas in the number of trees per plot for any species, including *A. rubrum*. The difference in the number of *A. rubrum* trees was not statistically significant between the three treatment areas in the deciduous (P-value 0.4) or coniferous (P-value 0.1) forest-types. The mean dbh of all the live trees was similar in all three treatment areas: around 22 cm. Live tree dbh ranged from 12.7 to around 70 cm in all three treatment areas (Table 9). The overall number of snags was also similar between the three treatment areas: 14%,

Table 5. Forb, fern, graminoid, and introduced forb and grass species recorded at Bear Brook Watershed in Maine in 1997.

Family name	Genus and species	Common name
Forbs		
ARACEAE (arum family)		
	Arisaema triphyllum (L.) Schott	jack-in-the-pulpit
ARALIACEAE (ginseng family)		
	Aralia nudicaulis L.	wild sarsaparilla
ASTERACEAE (aster family)		
	**Anaphalis margaritacea* (L.) Benth.& Hook.	pearly everlasting
	Aster spp.	aster
	**Aster acuminatus* Michx.	whorled aster
	Prenanthes alba L.	rattlesnake-root; white lettuce
	**Solidago* spp.	goldenrod
CORNACEAE (dogwood family)		
	Cornus canadensis L.	bunchberry
EQUISETACEAE (horsetail or scouring rush family)		
	**Equisetum* sp.	horsetail
LILIACEAE (lily family)		
	Clintonia borealis(Aiton) Raf.	clintonia; bead-lily
	Maianthemum canadense Desf.	false lily-of-the-valley; Canada mayflower
	Medeola virginiana L.	Indian cucumber-root
	Polygonatum pubsecens (Willd.) Pursh.	Solomon's-seal
	Smilacina racemosa (L.) Desf.	false Solomon's-seal
	Streptopus amplexifolius (L.) DC.	twisted stalk
	Trillium erectum L.	purple trillium
	Trillium undulatum Willd.	painted trillium
	Uvularia sessilifolia L.	wild oats
LYCOPODIACEAE (clubmoss family)		
	Lycopodium spp.	clubmoss
MONOTROPACEAE (Indian pipe family)		
	**Monotropa uniflora* L.	Indian pipe
ORCHIDACEAE (orchid family)		
	**Cypripedium acaule* Aiton.	lady-slipper; moccasin-flower
OXALIDACEAE (wood-sorrel family)		
	**Oxalis montana* Raf.	northern wood-sorrel
PRIMULACEAE (primrose family)		
	Trientalis borealis Raf.	starflower
RANUNCULACEAE (buttercup family)		
	Coptis trifolia (L.) Salisb. var. *groenlandica* (Oeder) Fassett.	goldthread)
ROSACEAE (rose family)		
	**Fragaria vesca* L.	thin-leaved wild strawberry
	Fragaria virginiana Duchesne.	thick-leaved wild strawberry
RUBIACEAE (madder family)		
	**Galium triflorum* Michx.	sweet-scented bedstraw
	Mitchella repens L.	partridge-berry

Table 5. Continued.

Family name	Genus and species	Common name
VIOLACEAE (violet family)		
	Viola spp.	violet
Ferns		
ASPLENIACEAE (spleenwort family)		
	**Athyrium filix-femina* (L.) Roth.	lady-fern
	Dryopteris campyloptera Clarkson.	mountain wood-fern
	Gymnocarpium dryopteris (L.) Newman.	oak-fern
	Polystichum acrostichoides (Michx.) Schott.	Christmas-fern
	Thelypteris phegopteris (L.) Slosson	narrow, northern, or long beech fern
	Thelypteris noveboracensis (L.) Nieuwl.	New York fern
DENNSTAEDTIACEAE (bracken family)		
	Dennstaedtia punctilobula (Michx.) Moore	hay-scented fern
OSMUNDACEAE (royal fern family)		
	Osmunda claytoniana L.	interrupted fern
POLYPODIACEAE (polypody family)		
	**Polypodium vulgare* (L.)	common polypody
Graminoids		
CYPERACEAE (sedge family)		
	Carex spp.	sedge
POACEAE (grass family)		
	Unidentified spp.	grass
Introduced Forbs		
ASTERACEAE (aster family)		
	**Achillea millefolium* L.	common yarrow
FABACEAE (pea or bean family)		
	**Trifolium* sp.	clover
	**Vicia cracca* L.	bird-vetch
POLYGONACEAE (smartweed family)		
	Polygonum convolvulus L.	black bindweed
Introduced Grasses		
GRAMINEAE (grass family)		
	Poa spp.	bluegrass – possible native species

*Species within the watershed or adjacent areas which did not occur in the study plots. The nomenclature above is that of Gleason & Cronquist (1991).

Table 6. Epiphytic foliose and fruticose macrolichens within Bear Brook Watershed in Maine in 1996 (these species were present on tree boles and branches).

Species Code[1]	Genus and species
Macrolichens	
1012	*Allocetraria oakesiana* Tuck. {*Cetraria oakesiana* Tuck.}
301	*Anaptychia palmulata* (Michx.) Vain. {*Anaptychia palmatula* (Michx.) Vain.}
609	*Bryoria furcellata* (Fr.) Brodo & Hawks.
614	*Bryoria nadvornikiana* (Gyel.) Brodo & Hawks.
8301	*Candelaria concolor* (Dicks.) Stein.
1102	*Cetrelia chicitae* (Culb.) Culb. & Culb.
1104	*Cetrelia olivetorum* (Nyl.) Culb. & Culb.
1200	*Cladonia* (sp.)
1200	*Cladonia* (sp.)
1207	*Cladonia caespiticia* (Pers.) Flk.
1210	*Cladonia chlorophaea* (Flk.) Spreng.
1211	*Cladonia coniocraea* (Flk.) Spreng.
1244	*Cladonia furcata* (Huds.) Schred.
1233	*Cladonia pyxidata* (L.) Hoffm.
1415	*Collema subflaccidum* Degel.
2403	*Evernia mesomorpha* Nyl.
2501	*Everniastrum catawbiense* (Degel.) Hale
2601	*Flavoparmelia caperata* (L.) Hale {*Pseudoparmelia caperata* (L.) Hale}
2822	*Heterodermia speciosa* (Wulf.) Trev.
3110	*Hypogymnia krogiae* Ohlss. {*Hypogymnia krogii* Ohlss.}
3116	*Hypogymnia physodes* (L.) Nyl.
3121	*Hypogymnia tubulosa* (Schaer.) Hav.
3301	*Imshaugia aleurites* (Ach.) Nyl. {*Parmeliopsis aleurites* (Ach.) Nyl.}
3611	*Leptogium cyanescens* (Ach.) Korb.
3624	*Leptogium laceroides* (Lesd.) Jorg.
3628	*Leptogium milligranum* Sierk
3905	*Lobaria pulmonaria* (L.) Hoffm.
3906	*Lobaria quercizans* Michx.
4004	*Melanelia exasperatula* Nyl. {*Parmelia exasperatula* Nyl.}
4005	*Melanelia fuliginosa* (Lamy) Nyl. {*Parmelia glabratula* (Lamy) Nyl.}
4008	*Melanelia halei* Athi {*Parmelia halei* Athi}
4011	*Melanelia olivacea* (L.) Ach. {*Parmelia olivacea* (L.) Ach.}
4013	*Melanelia septentrionalis* (Lynge) Ahti {*Parmelia septentrionalis* (Lynge) Ahti}
4015	*Melanelia subaurifera* Nyl. {*Parmelia subaurifera* Nyl.}
4101	*Menegazzia terebrata* (Hoffm.) Mass.
4201	*Myelochroa aurulenta* (Tuck.) Hale {*Parmelina aurulenta* (Tuck.) Hale}
4202	*Myelochroa galbina* (Ach.) Hale {*Parmelina galbina* (Ach.) Hale}
4801	**Parmelia fertilis*
4804	*Parmelia saxatilis* (L.) Ach.
4805	*Parmelia squarrosa* Hale
4806	*Parmelia sulcata* Tayl.

Table 6. Continued.

Species Code[1]	Genus and species
5201	*Parmeliopsis ambigua* (Wulf.) Nyl.
5301	*Parmotrema arnoldii* (DR.) Hale
5511	*Peltigera polydactylon* (Neck.) Hoffm. {*Peltigera polydactyla* (Neck.) Hoffm.}
5600	*Phaeophyscia* sp.
5613	*Phaeophyscia pusilloides* (Zahlbr.) Essl.
5614	*Phaeophyscia rubropulchra* (Degel.) Moberg
5701	*Physcia adscendens* (Fr.) Oliv.
5702	*Physcia aipolia* (Ehrh.) Hampe
5716	*Physcia millegrana* Degel.
5723	*Physcia stellaris* (L.) Nyl.
5901	*Physconia detersa* (Nyl.) Poelt
6101	*Platismatia glauca* (L.) Culb. & Culb.
6106	*Platismatia tuckermanii* (Oakes) Culb. & Culb.
6301	*Pseudevernia cladonia* (Tuck.) Hale & Culb.
6708	*Punctelia rudecta* Ach. {*Parmelia rudecta* Ach.}
6808	*Pyxine sorediata* (Ach.) Mont.
6901	*Ramalina americana* Hale
6910	*Ramalina dilacerata* (Hoffm.) Bowler & Rund. {*Fistulariella dilacerata* (Hoffm.) Bowler & Rund.}
1001	*Tuckermannopsis americana* Culb. {*Cetraria halei* Culb.}
1013	*Tuckermannopsis orbata* (Tuck.) Nyl. {*Cetraria orbata* (Tuck.) Nyl.}
1017	*Tuckermannopsis sepincola* (Ehrh.) Ach. {*Cetraria sepincola* (Ehrh.) Ach.}
8029	*Usnea filipendula* (Ach.) Nyl. {*Usnea dasypoga* (Ach.) Nyl.}
8072	*Usnea subfloridana* Stirt.
1015	*Vulpicida pinastri* (Scop.) S. Gray {*Cetraria pinastri* (Scop.) S. Gray}

[1]North American epiphytic macrolichen species codes.
*First known reported location of this lichen species in the USA.
The nomenclature above is that of Hale (1979), with updated name changes from Esslinger and Egan (1995).
Older species names as they appeared in Hale 1979 are represented within {}.

15%, and 12%, respectively, in West Bear, East Bear, and A&Y (Table 7).

The same six major dominant tree species were also the dominant species for the saplings (Table 10). These species made up 100%, 85%, and 86% of all the saplings in West Bear, East Bear, and A&Y, respectively (Table 8). By individual species, *F. grandifolia* represented the largest percentage, between 45% and 58%, of the saplings in all three treatment areas. *Picea rubens* was the second most common sapling species, constituting between 15% and 27% of all the saplings in each treatment area.

Table 7. Forest mensuration indicator: number of trees per plot (sum of all four subplots within each cluster-plot), by species, at Bear Brook Watershed, Maine, in 1997.

Species	FHM Code	Number of trees per cluster-plot W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10	Total
Abies balsamea	012	1	0	0	0	0	0	0	0	0	0	1
Acer pensylvanicum	315	2	0	3	1	0	1	1	0	1	1	10
Acer rubrum	316	2	0	0	0	0	1	1	1	0	3	8
Acer saccharum	318	1	4	4	2	23	1	30	0	0	0	65
Betula alleghaniensis	371	8	2	0	1	1	1	0	1	1	17	32
Betula populifolia	379	0	0	0	0	0	0	0	0	0	1	1
Fagus grandifolia	531	25	12	39	27	17	6	15	0	0	0	141
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	3	2	7	1	4	24	9	65	58	17	190
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	1	1
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	0	0	0	0	0	0	1	1
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
snags		2	7	16	8	10	4	8	8	8	4	75
TOTAL		44	27	69	40	55	38	64	75	68	45	525
		E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10	Total
Abies balsamea	012	0	0	0	3	1	0	0	0	0	0	4
Acer pensylvanicum	315	0	0	0	0	0	0	0	0	0	0	0
Acer rubrum	316	0	0	1	0	0	0	1	0	0	0	2
Acer saccharum	318	5	1	1	7	23	5	6	2	0	10	60
Betula alleghaniensis	371	1	0	2	1	0	1	3	2	6	10	26
Betula populifolia	379	5	4	3	12	4	7	2	6	0	7	50
Fagus grandifolia	531	0	0	0	0	0	0	0	0	0	0	0
Fraxinus americana	541	10	14	17	6	12	6	18	29	50	12	174
Picea rubens	097	5	9	13	18	20	14	23	14	6	11	133
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	1	0	0	0	0	0	0	0	0	0	1
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	2	2
snags		5	8	7	6	7	5	7	11	19	5	80
TOTAL		32	36	44	53	67	38	60	64	81	57	532

Like the trees and saplings, the six dominant tree species were also the dominant species for the seedlings (Table 11). These species made up 100%, 89%, and 99% of all the seedlings in West Bear, East Bear, and A&Y, respectively (Table 8). In West Bear *A. saccharum* (40%) and *A. pensylvanicum* (30%) were the most abundant seedling species. In East Bear *B. alleghaniensis* (36%) and *F. grandifolia* (23%) were most abundant. In A&Y *A. pensylvanicum* (27%) and

Table 7. Continued.

Species	FHM Code	Number of trees per cluster-plot A-1	A-2	A-3	A-4	A-5	Y-1	Y-2	Y-3	Y-4	Y-5	Total
Abies balsamea	012	0	0	12	1	0	0	0	0	0	0	13
Acer pensylvanicum	315	3	0	0	0	0	4	2	0	1	0	10
Acer rubrum	316	2	0	0	0	0	0	6	17	10	7	42
Acer saccharum	318	1	0	0	0	9	2	0	0	8	0	20
Betula alleghaniensis	371	1	9	1	8	0	2	1	0	4	9	35
Betula populifolia	379	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	531	14	4	2	0	34	33	7	0	5	0	99
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	4	39	64	41	3	3	32	45	22	33	286
Pinus strobus	129	0	1	0	0	0	0	0	0	0	0	1
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	1	0	0	0	0	1	0	1	3
Sorbus americana	935	0	0	0	2	0	0	0	0	0	0	2
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
snags		2	9	14	2	9	9	5	9	5	8	72
TOTAL		27	62	94	54	55	53	53	72	55	58	583

were *F. grandifolia* (24%) were the most abundant species. Two plots in West Bear (W-2 and W-3) had a large number of *A. pensylvanicum* seedlings. One plot in West Bear (W-2) had a large number of *A. saccharum* seedlings. One plot in East Bear (E-2) had a large number of *B. alleghaniensis* seedlings. The only significant difference for seedlings between in West Bear and East Bear and A&Y was the higher number of *A. saccharum* seedlings (P-value 0.049) in West Bear.

A total of 65 different lichen species was identified in the two treatment areas at BBWM; 51 of these species were found in West Bear and 57 species in East Bear (Table A-10). *Parmelia fertilis*, which occurred in three plots in both West and East Bear, had never been recorded in the USA prior to this. Three other lichen species also found at BBWM, *Everniastrum catawbiense, Melanelia exasperatula,* and *Parmotrema arnoldii*, were thought to be rare in Maine - having only been sited in one, two or three other locations, respectively (Hinds et al. 1998). On average, there were 26 species per plot recorded in West Bear and 28 species per plot recorded in East Bear. The difference between West Bear and East Bear in the number of species per plot was not statistically significant (P-value 0.3). Seven lichen species were recorded only in West Bear and 12 species were recorded only in East Bear (Table 12).

Table 8. Forest mensuration indicator: percentage of the total number of trees, saplings, and seedlings per plot of the six major dominant species at Bear Brook Watershed in Maine in 1997.

Species: Latin name	Common name	West Bear*	East Bear	A&Y
		---------- % ----------		
Trees				
Acer pensylvanicum	striped maple	2	0.4	2
Acer rubrum	red maple	2[a]	13[a]	8
Acer saccharum	sugar maple	15	6	4
Betula alleghaniensis	yellow birch	7	11	7
Fagus grandifolia	American beech	31	38	19
Picea rubens	red spruce	42	30	56
Total % of live trees		99	98	96
Saplings				
Acer pensylvanicum	striped maple	5	1	4
Acer rubrum	red maple	0	4	8
Acer saccharum	sugar maple	9	3	0
Betula alleghaniensis	yellow birch	6	6	2
Fagus grandifolia	American beech	58	56	45
Picea rubens	red spruce	22	15	27
Total % of saplings		100	85	86
Seedlings				
Acer pensylvanicum	striped maple	30	16	27
Acer rubrum	red maple	1	6	11
Acer saccharum	sugar maple	40[a]	4[a]	12
Betula alleghaniensis	yellow birch	11	36	15
Fagus grandifolia	American beech	14	23	24
Picea rubens	red spruce	4	4	10
Total % of seedlings		100	89	99

*Manipulated watershed.
[a]Significant difference between West Bear and East Bear.

The average lichen abundance per plot, of all species combined, in West Bear was 2.34. This was very similar to the average lichen abundance per plot in East Bear at 2.35 (Table 12). Two of the lichen species occurred much more frequently in East Bear, these were *Melanelia olivacea,* which occurred in six plots in East Bear and not at all in West Bear, and *Melanelia subaurifera,* which occurred in all ten plots in East Bear and in only five plots in West Bear (Table A-7). Five lichen species were very common, being found in all the plots in both treatment areas; these were *Hypogymnia physodes, Melanelia halei, Parmelia sulcata, Phaeophyscia rubropulchra,* and *Punctelia rudecta*.

Table 9. Forest mensuration indicator: number of live trees, of the major dominant species, by dbh (in 5-cm size classes) at Bear Brook Watershed in Maine in 1997.

	Number of trees in 5-cm dbh classes											
	12.7-17.8	17.9-22.8	22.9-27.8	27.9-32.8	32.9-37.8	37.9-42.8	42.8-47.8	47.9-52.8	52.9-57.8	57.9-62.8	62.9-67.8	67.9-71.5
All live trees												
West Bear*	194	108	59	35	26	8	6	4	3	2	3	2
East Bear	181	122	61	41	18	15	5	5	3	0	1	0
A&Y	204	137	71	48	28	7	9	1	3	3	0	0
Acer pensylvanicum												
West Bear*	8	2	0	0	0	0	0	0	0	0	0	0
East Bear	1	1	0	0	0	0	0	0	0	0	0	0
A&Y	10	0	0	0	0	0	0	0	0	0	0	0
Acer rubrum												
West Bear*	2	2	1	1	1	1	0	0	0	0	0	0
East Bear	29	15	10	4	0	1	1	0	0	0	0	0
A&Y	15	12	6	3	3	1	2	0	0	0	0	0
Acer saccharum												
West Bear*	34	17	4	1	1	1	0	2	0	2	1	2
East Bear	15	8	0	0	0	1	0	1	0	0	1	0
A&Y	5	10	0	0	0	1	1	1	1	1	0	0
Betula alleghaniensis												
West Bear*	13	9	2	4	0	0	0	0	3	0	1	0
East Bear	16	15	6	0	5	2	1	3	2	0	0	0
A&Y	18	6	2	2	2	1	1	0	2	1	0	0
Fagus grandifolia												
West Bear*	80	36	14	4	4	0	2	1	0	0	0	0
East Bear	85	55	15	13	3	2	1	0	0	0	0	0
A&Y	52	28	8	6	3	0	2	0	0	0	0	0
Picea rubrens												
West Bear*	55	41	38	25	19	6	4	1	0	0	1	0
East Bear	32	27	28	24	10	8	2	1	1	0	0	0
A&Y	93	76	53	37	20	3	3	0	0	1	0	0

*Manipulated watershed.

Table 10. Forest mensuration indicator: number of live saplings per plot (sum of all four subplots within each cluster-plot), by species, at Bear Brook Watershed, Maine, in 1997.

Species	FHM Code	Number of trees per cluster-plot										
		W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10	Total
Abies balsamea	012	0	0	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	315	1	0	0	0	0	1	0	0	1	0	3
Acer rubrum	316	0	0	0	0	0	0	0	0	0	0	0
Acer saccharum	318	0	0	0	0	2	0	4	0	0	0	6
Betula alleghaniensis	371	0	0	0	0	0	0	0	0	1	3	4
Betula populifolia	379	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	531	16	1	8	5	3	3	1	0	0	0	37
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	2	0	0	0	0	2	0	5	3	2	14
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		19	1	8	5	5	6	5	5	5	5	64
		E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10	Total
Abies balsamea	012	0	0	0	7	2	0	0	0	0	0	9
Acer pensylvanicum	315	0	0	0	0	0	0	0	1	0	0	1
Acer rubrum	316	0	0	0	1	1	0	1	0	0	0	3
Acer saccharum	318	0	0	0	0	0	1	0	0	1	0	2
Betula alleghaniensis	371	0	0	0	4	0	0	0	0	0	0	4
Betula populifolia	379	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	531	2	5	8	9	7	0	0	2	4	2	39
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	0	3	1	2	0	2	2	0	0	0	10
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	1	0	0	0	0	0	0	1
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		2	8	9	24	10	3	3	3	5	2	69
		A-1	A-2	A-3	A-4	A-5	Y-1	Y-2	Y-3	Y-4	Y-5	Total
Abies balsamea	012	0	1	0	0	0	0	0	0	0	0	1
Acer pensylvanicum	315	0	0	0	0	0	0	0	0	2	0	2
Acer rubrum	316	0	0	0	0	0	0	3	1	0	0	4
Acer saccharum	318	0	0	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	371	0	0	1	0	0	0	0	0	0	0	1
Betula populifolia	379	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	531	5	0	0	0	10	5	2	0	0	0	22
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	1	4	1	2	0	0	4	1	0	0	13
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	6	0	0	0	0	0	0	6
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		6	5	2	8	10	5	9	2	2	0	49

Table 11. Forest mensuration indicator: number of live seedlings per plot (sum of all four subplots within each cluster-plot), by species, at Bear Brook Watershed, Maine, in 1997.

Species	FHM Code	Number of trees per cluster-plot										
		W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10	Total
Abies balsamea	012	0	0	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	315	0	66	65	31	8	6	12	0	0	3	191
Acer rubrum	316	0	0	1	0	0	1	2	0	0	0	4
Acer saccharum	318	5	156	5	57	16	2	4	0	0	0	245
Betula alleghaniensis	371	8	7	15	18	4	16	2	0	0	0	70
Betula populifolia	379	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	531	5	14	26	19	6	4	9	0	2	0	85
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	0	0	4	2	0	7	1	0	10	2	26
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		18	243	116	127	34	36	30	0	12	5	621
		E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10	Total
Abies balsamea	012	1	1	0	7	0	0	0	1	0	0	10
Acer pensylvanicum	315	24	16	6	0	5	1	2	14	11	0	79
Acer rubrum	316	4	1	0	0	6	0	5	10	0	5	31
Acer saccharum	318	6	3	1	0	0	1	8	2	0	1	22
Betula alleghaniensis	371	16	105	0	1	11	9	3	27	2	4	178
Betula populifolia	379	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	531	6	8	9	2	12	5	10	31	27	4	114
Fraxinus americana	541	0	13	0	0	0	0	0	0	0	0	13
Picea rubens	097	3	7	1	3	3	0	0	1	0	1	19
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	4	13	17
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	4	0	0	0	1	0	1	6
Tsuga canadensis	261	3	0	0	0	0	0	0	0	0	0	3
TOTAL		63	154	17	17	37	16	28	87	44	29	492
		A-1	A-2	A-3	A-4	A-5	Y-1	Y-2	Y-3	Y-4	Y-5	Total
Abies balsamea	012	0	2	1	0	0	0	0	0	0	2	5
Acer pensylvanicum	315	4	2	0	0	41	3	40	0	20	0	110
Acer rubrum	316	0	0	0	0	14	2	25	0	2	1	44
Acer saccharum	318	30	0	0	0	5	6	9	0	0	0	50
Betula alleghaniensis	371	14	0	0	0	3	20	19	1	3	0	60
Betula populifolia	379	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	531	19	3	0	0	28	20	24	0	1	1	96
Fraxinus americana	541	0	0	0	0	0	0	1	0	0	0	1
Picea rubens	097	1	28	1	1	0	1	1	0	1	5	39
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	1	0	0	0	0	0	0	0	7	0	8
Prunus virginiana	763	0	0	0	0	2	0	0	0	1	0	3
Quercus rubra	833	0	0	0	0	0	0	2	0	1	0	3
Sorbus americana	935	0	0	0	5	4	0	0	0	0	2	11
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		69	35	2	6	97	52	121	1	36	11	430

The vegetation structure indicator results include a detailed inventory of species composition and relative abundance of the flora at BBWM. The results are summarized in Tables 13 and 14. Due to the contrast between deciduous and coniferous forest-types in both overstory and understory vegetation, further vegetation structure data results will be discussed in the following section, which describes these forest-types at BBWM.

Forest-types

Classification descriptions and locations

The cluster-plot design of the FHM program was designed to be analyzed as a cluster of four subplots. Cluster-plot analyses of the number of overstory trees by species and the general understory characteristics showed that there were four FHM forest-type groups at BBWM: *A. saccharum/F. grandifolia/B. alleghaniensis, A. rubrum*/northern hardwoods, *P. rubens*, and *P. rubens/A. balsamea* (Table 15). Stand tree size analyses using cluster-plots indicated that 100% of the forest at BBWM was poletimber size. Figure 5 shows the locations of the forest-types at BBWM. This is based on cluster plot analyses and a 1996 NAPP black-and-white aerial photograph of the area (photograph number 9191-21 taken on May 19).

Using the subplot data for forest-type analyses provided a smaller scale, higher resolution mapping of the forest-types at BBWM. Although subplot analyses showed the same four forest-types at Bear Brook (*A. saccharum/F. grandifolia/B. alleghaniensis, A. rubrum*/northern hardwoods, *P. rubens* and *P. rubens/A. balsamea*) as the cluster plot analyses, the distribution of these forest-types using subplots reflected a much more heterogeneous landscape (Table 15). Also in contrast to the cluster plot stand tree size results, stand tree size analysis using subplots indicated that approximately 81% of the forest at BBWM was poletimber size and 19% (23 out of 120 subplots) was sawtimber size. Figure 6 shows the location of the different forest-types and stand sizes at BBWM based subplot analyses. The following sections that describe the various forest-types in more detail use analyses based on the subplots.

Acer saccharum/Fagus grandifolia/Betula alleghaniensis *forest-type. Acer saccharum/Fagus grandifolia/Betula alleghaniensis* forest-type made up the largest percentage of the subplots in West Bear (65%) and East Bear (57%), and one-third of the coverage in A&Y (33%) (Table 15). A small percentage of the plots (between 5%

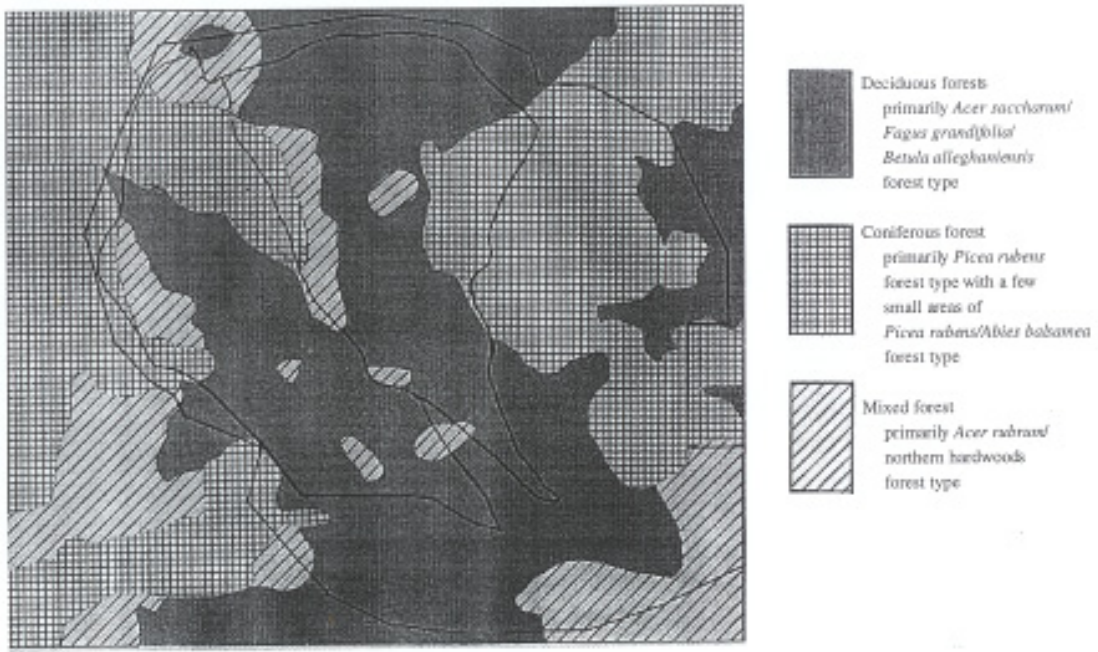


Figure 5. Location of deciduous, coniferous, and mixed forests at Bear Brook Watershed in Maine based on a 1996 NAPP aerial photograph and 1997 cluster-plot analyses.

Table 12. Lichen communities indicator: summary of species and abundance results from Bear Brook Watershed in Maine in 1996.

	FHM Program Abundance Rating									
	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10
West Bear*										
Total abundance	66	69	64	68	42	61	54	51	55	63
Avg abundance/plot	2.4	2.4	2.2	2.3	2.5	2.2	2.2	2.2	2.2	2.33
Average abundancefor the watershed: 2.34										
Total # of species	27	29	29	29	17	28	25	23	25	27
Average number of species per plot: 25.9										
Total number of species identified in the watershed: 51										
Species that only occurred in West Bear: *Cladonia caespiticia, C. chlorophaea, Leptogium milligranum, Melanelia septentrionalis, Pseudevernia cladonia, Physcia aipolia, Tuckermannopsis americana*										

	FHM Program Abundance Rating									
	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10
East Bear										
Total abundance	46	59	65	78	45	72	71	67	73	79
Avg abundance/plot	2.3	2.4	2.4	2.4	2.6	2.4	2.3	2.0	2.3	2.39
Average abundance for the watershed: 2.35										
Total # of species	20	25	27	32	17	30	31	34	32	33
Average number of species per plot: 28.1										
Total number of species identified in the watershed: 57										
Species that only occurred in East Bear: *Bryoria nadvornikiana, Cladonia furcata, Leptogium laceroides, Melanelia exasperatula*, *Parmotrema arnoldii, Ramalina dilacerata, Tuckermannopsis sepincola, Usnea filipendula, Candelaria concolor*, *Peltigera polydactyla, Cladonia pyxidata, Melanelia olivacea*										

*Manipulated watershed.

Table 13. Vegetation structure indicator: percentage abundance of vegetation, by species, and other ground cover within one square meter quadrats at BBWM in 1997.

Species	Percentage abundance per 1m²									
	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10
Strata 1 (0–0.6 m)										
Aralia nudicaulis	0.5	0.8	0.03	5.9	3.4	0	0	0	0	0
Arisaema triphyllum	0	0	0	0	0	0	0	0	0	0
Aster spp.	0.5	2.9	3.4	3.6	1.7	3.8	0.6	0.03	0	0
Clintonia borealis	0	0	0	0	0	0	0	0	0	0.2
Coptis trifoliata	0	0	0	0.1	0	0	0	0	0	0
Cornus canadensis	0	0	0	0	0	0	0	0	0	0.5
Fragaria virginiana	0	0	0	0	0	0	0	0	0	0
Lycopodium spp.	0	0	0	0	0	0	0	0	0	0
Maianthemum canadense	0.3	1.4	0.9	0	0.6	0.1	0	0	0.03	4.2
Medeola virginiana	0	0.4	0	0	0	0	0	0	0	0
Polygonatum pubescens	0	0	0	0.2	0.1	0	0.3	0	0.2	0
Polygonum convolvulus	0	0	0	0.01	0.1	0	0	0	0	0
Prenanthes alba	0.03	0	0	0	0	0	0	0	0	0
Smilacina stellata	0	0	0	0	0	0	0	0	0	0
Trientalis borealis	0.3	1.0	1.0	0.9	2.4	0.5	0.4	0	0	0.5
Trifolium spp.	0	0	0	0	0	0	0.5	0	0	0
Trillum erectum	0	0	0	0	1.3	0	0	0	0	0
Trillium spp.	0	0	0	0	0	0	0	0	0	0
Uvularia sessilifolia	5.3	7.5	0.7	6.9	7.3	5.5	5.0	0	0	0.1
Viola spp.	0	0.2	0	0.1	0	0	0.1	0	0	0
carex spp.	0	0	0.2	0	0	0	0	0	0	0
grass spp.	0	0.1	0	0.4	0.5	0.03	0.1	0	0.01	8.2
Dennstaedtia punctilobula	0	0	0	0	0.7	6.1	0	0	0	0
Dryopteris campyloptera	12.2	2.8	0.2	3.8	23.2	0	18.9	0	0	21.1
Gymnocarpium dryopteris	1.9	4.9	2.5	5.8	0	0	0.9	0	0	0
Osmunda claytoniana	0	0	0	0	0	0	0	0	0	0
Polystichum acrostichoides	0	0	0.1	0	0.7	0	0	0	0	0
Thelypteris noveboracensis	0	4.1	0	0	9.3	0	0.1	0	0	0
Thelypteris phegopteris	0	0	0	0.3	0.2	1.4	0	0	0	0
Cornus alternifolia	0	0	0	0	0	0	0	0	0	0
Diervilla lonicera	0	0	0	0	0	0	0	0	0	0
Lonicera canadensis	0	0.4	0	0	0	0	0	0	0	0
Ribes glandulosum	0	0	0	0	0	0	0	0	0	0
Rubus spp.	2.1	0	0.03	3.2	3.9	0	0	0	0	0
Vaccinium spp.	0	0	0	0	0	0	0	0	0	0
Viburnum acerifolium	0	0.5	0	0	0	0	0	0	0	0
Viburnum alnifolium	4.6	5.1	8.8	5.8	3.8	0	0	0	0	0
rock (bare & exposed)	0.4	0	0	0	0.4	0.3	0.2	0.1	1.3	0.2
bare ground/ litter	54.2	32.4	53.1	39.1	29.4	59.2	52.7	83.6	73.3	32.7
moss	2.9	1.4	2.1	1.3	4.0	5.0	1.1	8.2	6.0	1.7
lichens	1.1	1.9	2.1	0.9	0.5	1.6	0.7	1.1	4.5	4.2
mushrooms	0.1	0	0	0	0	0	0	0	0	0
tree stump	0.2	0	0	0	0	0.7	0	0	0	0
downed log (> 10 cm)	1.6	3.7	3.0	0	1.2	3.6	0	2.5	1.3	0
animal droppings	0	0	0.3	0	0	0	0	0	0	0
unknown cotelyden	0.2	0.0	0	0.01	0	0	0	0	0	0
Abies balsamea	0.3	0	0	0	0	0	0	0	0	0

Table 13. Continued.

Species	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10
	---------- Percentage abundance per 1m^2 ----------									
Acer pensylvanicum	4.8	11.7	10.9	8.0	4.9	1.6	6.1	0	0.03	0.01
Acer rubrum	0.1	0.3	0.0	1.2	0.4	0.3	2.0	0.01	0	0.04
Acer saccharum	8.7	24.7	3.3	10.1	2.4	1.0	0.5	0	0	0.1
Betula alleghaniensis	1.2	1.1	3.1	4.2	1.1	1.9	0.6	0.03	0.2	0
Fagus grandifolia	3.9	3.8	4.3	7.4	6.8	0.8	5.1	0.1	0	1.5
Quercus rubra	0	0	0	0	0	0	0.2	0	0	0
Picea rubens	0.9	0.1	0.1	1.1	0.1	7.4	0.03	1.8	2.1	7.3
Prunus serotina	0	0	0.03	0	0	0	0	0	0	0.3
Sorbus americana	0	0	0	0	0	0	0	0	0.1	0.5
snag	2.0	0	3.9	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0.2	0	0	0	0
Total	110.0	113.0	103.8	110.1	109.9	100.9	96.0	97.4	89.0	83.3
	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10
Aralia nudicaulis	8.3	4.8	1.8	0	0	0	0	6.6	0.4	0
Arisaema triphyllum	0	0	0	0	0	0	0	0	0.2	0
Aster spp.	2.3	0.7	4.9	0.1	4.6	6.4	3.8	2.1	2.0	1.6
Clintonia borealis	0	0	0	0	0	0	0	0	0	0
Coptis trifoliata	0	0	2.1	0.8	0	0	0	0	0	0
Cornus canadensis	0	0	0	0	0	0	0	0	0	2.8
Fragaria virginiana	0	0	0	0	0	0	0	0	0	0.4
Lycopodium spp.	0	0	0	0.1	0	0	0	0	0	0
Maianthemum canadense	0	0.3	0.8	0.5	0	0.2	0.2	2.2	0.3	8.0
Medeola virginiana	0.1	0	0	0.03	0	0	1.8	0	0	0
Polygonatum pubescens	0	0	0	0	0	0	0	0	0	0
Polygonum convolvulus	0	0	0	0	0	0	0.01	0	0.1	0.3
Prenanthes alba	0	0	0	0	0	0	0	0	0	0.03
Smilacina stellata	0	0	0	0	0	0	0	0	0	0
Trientalis borealis	0.9	1.5	0.8	0.4	1.0	0.8	0.8	1.6	0.7	3.4
Trifolium spp.	0	0	0	0	0	0	0	0	0	0
Trillum erectum	0	0	0	0	0	0	0	0	0	0
Trillium spp.	0	0	0	0	0	0.1	0	0	0	0
Uvularia sessilifolia	0.2	0.9	2.0	3.7	4.1	0.9	0.5	0	6.0	7.2
Viola spp.	0	0	0	0	0	0	0.1	0	0	0
carex spp.	0.3	0.1	0	0.9	0	0.1	0	1.3	0.3	0
grass spp.	0	0.8	0	0.3	0.3	0.4	0.9	0	0.8	3.8
Dennstaedtia punctilobula	0	0	0	0	0	0	0	0	0.4	0
Dryopteris campyloptera	0.8	1.5	0.6	0	0.5	20.7	17.9	8.3	35.8	30.0
Gymnocarpium dryopteris	0	0	0	0	0	0	0	1.3	0	0
Osmunda claytoniana	0	0	0	0	0.1	15.8	0	0	0	0
Polystichum acrostichoides	0	0	0	0	0	0	0	0	0	0
Thelypteris noveboracensis	0	0.6	0	0	0	0	0	0	0	0
Thelypteris phegopteris	0	0.2	0	0	0.2	0.1	0	0.5	0.4	0
Cornus alternifolia	0.6	0	0	0	0	0	0	0	0	0
Diervilla lonicera	0	0	0.2	0	0	0	0	0	0	0
Lonicera canadensis	0	0.8	0	0	0	0	0.8	0.03	0	0
Ribes glandulosum	0	0	0	0	0	0	1.6	0	0.5	0
Rubus spp.	0	1.6	1.3	0	0.1	0.3	0.1	0.2	0	0
Vaccinium spp.	0	0	0	0	0	0	0	0	0	0.3

Table 13. Continued.

Species	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10
	---------- Percentage abundance per 1m^2 ----------									
Viburnum acerifolium	0.1	0	0	0	0	0	0	0	0	0
Viburnum alnifolium	0.8	0.03	0	0	0	0	0	0.7	0	0
rock (bare & exposed)	0.1	0.7	0.3	2.7	0.4	0.2	10.7	0.3	3.4	0.6
bare ground/ litter	40.0	56.0	58.8	74.8	65.8	27.2	39.8	40.6	27.9	21.3
moss	4.2	3.4	4.6	5.2	3.6	4.9	8.6	4.9	5.4	5.8
lichens	5.7	1.5	2.5	2.6	1.4	1.3	5.2	1.1	2.3	2.2
tree stump	5.8	0	0.8	0.3	0	1.3	3.3	0	0	0
downed log (> 10 cm)	0	4.5	0	2.5	0.9	7.9	2.9	0.6	4.1	0
animal droppings	0	0	0	0.1	0	0	0	0	0	0
unknown cotelyden	0.1	0.1	0.0	0.0	0	0	0	0	0	0
Abies balsamea	0	0	0	0.5	0	0	0	1.2	0	0
Acer pensylvanicum	6.4	3.7	6.2	1.6	1.8	3.8	2.4	1.0	2.1	0.3
Acer rubrum	6.3	2.0	0.6	0.1	2.4	0.4	0.2	1.2	0	0.1
Acer saccharum	2.1	0.3	3.2	0.01		1.1	0.03	2.5	1.2	4.3
Betula alleghaniensis	4.2	9.4	10.4	0.2	2.9	3.7	2.5	3.7	0.6	0
Fagus grandifolia	9.5	1.6	1.9	1.4	5.8	3.0	4.1	15.3	15.4	0
Fraxinus americana	0	0	0.03	0	0	0	0	0	0	0
Picea rubens	0.2	7.9	1.8	2.4	1.6	0.5	0.9	2.0	0	0.03
Prunus virginiana	0	0	0	0	0	0	0	0.2	0.3	0
Sorbus americana	0	0	0	0	0	0	0	0.01	0	0.4
Tsuga canadensis	7.8	0	0	0	0	0	0	0	0	0
snag	1.0	0	0.1	0.3	2.5	0	0	0.8	0	2.9
dead red spruce branches	0	0	0	0	0.3	0	0	0	0	0
Total	107.7	104.6	105.4	101.3	100.2	101.1	109.0	100.1	110.4	95.8
	A&Y -1	A&Y -2	A&Y -3	A&Y -4	A&Y -5	A&Y -6	A&Y -7	A&Y -8	A&Y -9	A&Y -10
Aralia nudicaulis	2.2	0	0	0.3	5.4	11.6	0	0	3.7	0
Arisaema triphyllum	0	0	0	0	0	0	0	0	0	0
Aster spp.	1.6	0	0	0	7.3	0.6	0	0.7	0	0
Clintonia borealis	0	0	0	0.1	0	0	0	0	0	0
Coptis trifoliata	0.2	0	0	0	0	0	0	0	0.9	0
Cornus canadensis	0	0	0	0	0	0	0	0	0.8	1.3
Fragaria virginiana	0	0	0	0	0	0	0	0	0	0
Lycopodium spp.	0	0	0	0.4	0	0	0	0	0	0
Maianthemum canadense	0	0.3	0	0.1	2.9	0	1.0	2.5	0.7	0.7
Medeola virginiana	0	0	0	0	0	0.3	1.9	0	4.5	0
Polygonatum pubescens	0	0	0	0	1.8	0	0	0	0	0
Polygonum convolvulus	0	0	0	0	0	0	0.1	0	0	0
Prenanthes alba	0	0	0	0	0	0	0	0	0	0
Smilacina stellata	0.4	0	0	0	0	0	0	0	0	0
Trientalis borealis	0.4	0.1	0	0.3	3.6	1.0	1.3	1.5	1.2	0.7
Trifolium spp.	0	0	0	0	0	0	0	0	0	0
Trillum erectum	0	0	0	0	0	0	0	0	0	0
Trillium spp.	0	0	0	0	0.1	0	0	0	0	0
Uvularia sessilifolia	1.8	0	0	0	5.8	3.0	0.5	1.0	2.8	0.4
Viola spp.	0.5	0	0	0	0	0	0.03	0	0.03	0
carex spp.	0.03	0.1	0	0.03	0	0.2	0.5	0	0	0
grass spp.	0	0	0	7.6	0.8	0	0	0.9	3.8	0.4

Table 13. Continued.

Species	A&Y -1	A&Y -2	A&Y -3	A&Y -4	A&Y -5	A&Y -6	A&Y -7	A&Y -8	A&Y -9	A&Y -10
	---------- Percentage abundance per 1m^2 ----------									
Dennstaedtia punctilobula	0	0	0	0	0	0	0	0	1.7	0
Dryopteris campyloptera	1.3	0	0	12.5	28.0	0.7	9.7	27.9	16.9	15.0
Gymnocarpium dryopteris	0	0	0	0	0	0	0	0	0	0
Osmunda claytoniana	0	0	0	0	0	0	0	0	0	0
Polystichum acrostichoides	0	0	0	0	0	0	0	0	2.9	0
Thelypteris noveboracensis	0	0	0	0	0	0	0	0	0	0
Thelypteris phegopteris	0	0	0	0	0.2	0.3	0	0	0.5	0
Lonicera canadensis	0.7	0	0	0	0	0	0	0	0	0
Ribes glandulosum	0	0	0	0	0	0	0	2.0	0.3	1.4
Rubus spp.	2.6	0	0	0	0	0	3.4	0	0.8	0
Vaccinium spp.	0	0	0	1.6	0	0	0	0	0	0
Viburnum acerifolium	0.03	0	0	0	0	0	0	0	0	0
Viburnum alnifolium	0	0	0	0	1.0	2.3	0	0	0.4	0
rock (bare & exposed)	0.5	0	3.8	3.3	0	0.3	0	0.4	1.6	0.8
bare ground/ litter	62.3	70.6	78.5	43.9	16.9	58.4	54.4	51.3	28.3	59.0
moss	4.4	6.8	7.8	9.5	1.4	2.6	7.2	6.8	19.3	5.3
lichens	4.2	1.1	2.1	5.0	1.0	1.5	3.0	1.3	10.3	3.6
tree stump	0.6	0	0	0	0	0	0	0	0	1.8
downed log (> 10 cm)	4.6	2.1	5.6	3.0	0	0.8	2.3	0	2.7	0
unknown cotelyden	0.1	0.1	0.01	0.02	0	0.04	0.1	0.01	0.02	0
Abies balsamea	0	0	0.3	0.2	0	0	0	0	0	0
Acer pensylvanicum	1.7	0.4	0	0.4	5.9	8.8	6.4	0.5	1.0	0
Acer rubrum	0.3	0.4	0.04	1.6	2.0	0.4	5.8	0.1	0.1	0.4
Acer saccharum	8.1	0.01	0	0	6.3	0.5	1.4	0	0	0
Betula alleghaniensis	3.8	0	0.1	0.1	3.7	5.3	0.5	1.9	0.0	0.4
Betula populifolia	0	0.8	0	0	0	0	0	0	0	0
Fagus grandifolia	1.2	0	0.01	0	12.2	4.9	4.3	0.3	0.1	0.03
Fraxinus americana	0	0.6	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0.1	0	0	0	0	0.1	0	2.1
Picea rubens	0.5	0	0.3	2.5	0	1.0	7.0	0.2	1.2	1.2
Pinus strobus	0	15.3	0	0	0	0	0	0	0	0
Prunus virginiana	0	0	0	0	2.8	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	5.7	0
Sorbus americana	0	0	0	2.4	0.8	0	0	0	0.01	0.7
snag	0	0	0.1	0.1	0.8	0	0.1	0	0	0
dead red spruce branches	0	1.3	0.6	0.3	0	0	0	0	0.3	0
Total	103.9	99.9	99.3	95.2	110.6	104.4	110.6	99.6	112.1	95.2

Table 14. Vegetation structure indicator: percentage abundance of vegetation, by species, and other ground cover within one square meter quadrats at BBWM in 1997.

Species	Percentage abundance per 1m²									
	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10
Strata 2 (0.6–1.8m)										
Dryopteris campyloptera	0	0	0	0	0	0	0	0	0	0
Osmunda claytoniana	0	0.4	0	0	0	0	0.3	0	0	0
Cornus alternifolia	0	2.0	0	0	0	0	0	0	0	0
Lonicera canadensis	0	0	0	0	0	0	0	0	0	0
Rubus spp.	0	0	0	0	1.9	0	0	0	0	0
Viburnum alnifolium	2.3	2.0	1.8	2.5	0	0	0	0	0	0
Abies balsamea	0	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	3.1	4.7	9.3	4.3	0.8	0	0.7	0	0	0
Acer rubrum	0	0	0	1.3	0	0	4.6	0	0	0
Acer saccharum	5.4	7.4	0.3	0.7	2.3	0	2.0	0	0	0
Betula alleghaniensis	0.3	2.9		3.6	0.3	4.2	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	9.2	8.8	12.2	10.8	9.8	1.0	2.9	1.7	2.8	4.6
Fraxinus americana	1.3	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	0	0	2.5	0	0	0	14.3
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	0	0	0	0	0	0	0	0	0	0
snag	0.2	0	3.9	0	0	0	0	0	1.5	3.3
dead red spruce branches	0	0.8	1.3	1.7	0	0.3	0	0.2	1.6	0
downed log (>10 cm)	0	0	0	0	0	0	0	0	0	0
tip-up mound	0	0	0	0	0	0	0	0	0	0
Total	21.8	28.9	28.8	24.7	15.1	7.9	10.5	1.8	5.8	22.3
Strata 3 (1.8–4.9m)										
Abies balsamea	0	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	0	0	1.7	0	0	0	2.1	0	0	0
Acer rubrum	0	0	0	0	0	0	0	0	0	6.4
Acer saccharum	0	0	0	0	13.3	0	9.0	0	0	0
Betula alleghaniensis	0	0.4	0	0	0	0	0	0	0	3.3
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	27.1	13.5	29.0	26.1	10.0	14.2	12.8	0.7	7.2	18.1
Fraxinus americana	2.1	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Picea rubens	2.4	0	0.4	0	0	4.4	0	1.5	13.6	16.8
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	3.3
Sorbus americana	0	0	0	0	0	0	0	0	0	1.7
snag	0.2	0	2.3	0	0	0.4	0	0	0	0
dead red spruce branches	0	0	0	0	0	1.0	0	7.6	2.5	0
Total	31.8	13.9	33.3	26.1	23.3	20.0	23.8	9.8	23.3	49.4

Table 14. Continued.

Species	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10
	---------- Percentage abundance per 1m^2 ----------									
Strata 4 (>4.9m)										
Abies balsamea	5.8	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	3.7	0	0	2.1	0	5.4	5.8	0	1.8	3.3
Acer rubrum	7.9	0	0	0	0	2.9	5.0	1.7	0	5.0
Acer saccharum	18.3	25.6	4.2	7.1	48.3	9.6	44.6	0	0	0
Betula alleghaniensis	16.7	6.3		11.7	5.0	5.4	0	0	2.7	5.8
Fagus grandifolia	57.2	47.9	54.6	47.9	22.4	10.0	13.8	4.2	6.7	19.4
Fraxinus americana	0	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Picea rubens	0	2.1	17.9	5.0	1.8	51.9	0.5	59.9	53.8	11.2
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0	0	0
snag	0	0	1.3	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	0	0
Total	109.6	81.9	77.9	73.8	77.6	85.3	69.7	65.8	65.0	44.8
Strata 2 (0.6–1.8m)	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10
Dryopteris campyloptera	0	0	0	0	0	0	0	0	0	0
Osmunda claytoniana	0	0	0	0	0	7.9	0	0	0	0
Cornus alternifolia	0.3	0	0	0	0	0	0	0	0	0
Lonicera canadensis	0	0	0	0	0	0	0	0	0	0
Rubus spp.	0	0	0.2	0	0	0	0	0	0	0
Viburnum alnifolium	0	0	0	0	0	0	0	0	0	0
Abies balsamea	0	0	0	0.1	0	0	0	0.4	0	0
Acer pensylvanicum	2.2	5.2	0	0	0	1.3	0	0.2	0	0
Acer rubrum	1.1	0.1	0	0.3	0	0	0	0	0	0.3
Acer saccharum	0	0.7	0	0	0	0	0.8	0	0	3.2
Betula alleghaniensis	8.5	11.3	8.5	0.1	0	3.8	2.3	0	0	0.3
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	11.9	10.8	8.5	5.6	2.2	2.2	6.5	23.6	14.9	2.1
Fraxinus americana	0	0.4	0.1	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Picea rubens	0.0	8.7	2.4	6.2	0	0	0	2.3	0	0.4
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	2.4	0	0	0	0	0	0	0	0	0
snag	0.1	0.8	0.3	0.3	0	0	0	0	0	0
dead red spruce branches	0	0.5	0.1	0	0.4	2.9	0.7	0	0	2.0
downed log (>10 cm)	5.8	0	0	0	0	0	0	0	0	0
tip-up mound	0	0	0	0	0	0	0	0	0	0
Total	32.3	38.4	20.0	12.4	2.6	18.1	10.3	26.5	14.9	8.2
Strata 3 (1.8–4.9m)										
Abies balsamea	0	0	0	1.2	0	0	0	0	0	0
Acer pensylvanicum	0	10.7	0.3	0	0	4.6	0	0	0	0
Acer rubrum	0	0	0	0	0	0.8	0	0	0	0.4
Acer saccharum	0	0	1.3	0	0	9.6	3.3	1.3	1.3	9.6
Betula alleghaniensis	6.3	0.6	2.8	2.3	0	1.3	0	0	0	2.5

Table 14. Continued.

Species	Percentage abundance per 1m²									
	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	11.0	23.7	15.5	12.6	22.0	9.8	9.6	29.7	16.5	2.3
Fraxinus americana	0	2.9	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Picea rubens	0	3.1	8.1	8.9	1.8	2.9	2.1	1.7	0	2.3
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0	0	2.1
snag	0	0	0.1	0	0	2.5	0	0	0	0
dead red spruce branches	0	0.4	0	1.4	1.8	1.7	0.4	0	0	2.5
Total	17.3	41.3	28.0	26.4	25.6	33.1	15.4	32.6	17.8	21.7
Strata 4 (>4.9m)										
Abies balsamea	0	0	0	10.8	0	0	0	0	0	0
Acer pensylvanicum	2.1	0	0	0	0	0	0	2.5	0	0
Acer rubrum	14.2	10.5	0	12.5	27.1	5.0	5.4	0	0	6.7
Acer saccharum	6.3	6.3	18.8	0	0	21.3	10.4	1.7	5.0	20.2
Betula alleghaniensis	21.8	13.3	17.1	24.3	0	21.7	0	4.6	0	6.3
Fagus grandifolia	22.2	34.7	27.3	12.5	32.1	14.2	27.5	40.7	46.8	5.8
Fraxinus americana	5.8	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Picea rubens	7.1	18.8	21.7	11.2	22.5	15.8	20.0	13.3	7.5	9.2
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0	0	3.8
snag	0	0	0	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	0	0
Total	79.4	83.6	84.8	71.3	81.7	78.0	63.3	62.8	59.3	51.8
Strata 2 (0.6–1.8m)										
Dryopteris campyloptera	0	0	0	0	0	0	0	0	0	0
Osmunda claytoniana	0	0	0	0	0	7.9	0	0	0	0
Cornus alternifolia	0.3	0	0	0	0	0	0	0	0	0
Lonicera canadensis	0	0	0	0	0	0	0	0	0	0
Rubus spp.	0	0	0.2	0	0	0	0	0	0	0
Viburnum alnifolium	0	0	0	0	0	0	0	0	0	0
Abies balsamea	0	0	0	0.1	0	0	0	0.4	0	0
Acer pensylvanicum	2.2	5.2	0	0	0	1.3	0	0.2	0	0
Acer rubrum	1.1	0.1	0	0.3	0	0	0	0	0	0.3
Acer saccharum	0	0.7	0	0	0	0	0.8	0	0	3.2
Betula alleghaniensis	8.5	11.3	8.5	0.1	0	3.8	2.3	0	0	0.3
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	11.9	10.8	8.5	5.6	2.2	2.2	6.5	23.6	14.9	2.1
Fraxinus americana	0	0.4	0.1	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Picea rubens	0.0	8.7	2.4	6.2	0	0	0	2.3	0	0.4
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	2.4	0	0	0	0	0	0	0	0	0

Table 14. Continued.

Species	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10
	---------- Percentage abundance per 1m^2 ----------									
snag	0.1	0.8	0.3	0.3	0	0	0	0	0	0
dead red spruce branches	0	0.5	0.1	0	0.4	2.9	0.7	0	0	2.0
downed log (>10 cm)	5.8	0	0	0	0	0	0	0	0	0
tip-up mound	0	0	0	0	0	0	0	0	0	0
Total	32.3	38.4	20.0	12.4	2.6	18.1	10.3	26.5	14.9	8.2
Strata 3 (1.8–4.9m)										
Abies balsamea	0	0	0	1.2	0	0	0	0	0	0
Acer pensylvanicum	0	10.7	0.3	0	0	4.6	0	0	0	0
Acer rubrum	0	0	0	0	0	0.8	0	0	0	0.4
Acer saccharum	0	0	1.3	0	0	9.6	3.3	1.3	1.3	9.6
Betula alleghaniensis	6.3	0.6	2.8	2.3	0	1.3	0	0	0	2.5
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	11.0	23.7	15.5	12.6	22.0	9.8	9.6	29.7	16.5	2.3
Fraxinus americana	0	2.9	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Picea rubens	0	3.1	8.1	8.9	1.8	2.9	2.1	1.7	0	2.3
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0	0	2.1
snag	0	0	0.1	0	0	2.5	0	0	0	0
dead red spruce branches	0	0.4	0	1.4	1.8	1.7	0.4	0	0	2.5
Total	17.3	41.3	28.0	26.4	25.6	33.1	15.4	32.6	17.8	21.7
Strata 4 (>4.9m)										
Abies balsamea	0	0	0	10.8	0	0	0	0	0	0
Acer pensylvanicum	2.1	0	0	0	0	0	0	2.5	0	0
Acer rubrum	14.2	10.5	0	12.5	27.1	5.0	5.4	0	0	6.7
Acer saccharum	6.3	6.3	18.8	0	0	21.3	10.4	1.7	5.0	20.2
Betula alleghaniensis	21.8	13.3	17.1	24.3	0	21.7	0	4.6	0	6.3
Fagus grandifolia	22.2	34.7	27.3	12.5	32.1	14.2	27.5	40.7	46.8	5.8
Fraxinus americana	5.8	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Picea rubens	7.1	18.8	21.7	11.2	22.5	15.8	20.0	13.3	7.5	9.2
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0	0	3.8
snag	0	0	0	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	0	0
Total	79.4	83.6	84.8	71.3	81.7	78.0	63.3	62.8	59.3	51.8
	A&Y	A&Y	A&Y	A&Y	A&Y	A&Y	A&Y	A&Y	A&Y	A&Y
Strata 2 (0.6–1.8m)	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
Dryopteris campyloptera	0	0	0	0	0	0	0	0	0	0
Osmunda claytoniana	0	0	0	0	0	0	0	0	0	0
Cornus alternifolia	0	0	0	0	0	0	0	0	0	0
Lonicera canadensis	0	0	0	0	0	0	0	0	0	0
Rubus spp.	0	0	0	0	0	0	0	0	0	0
Viburnum alnifolium	0	0	0	0	1.0	0	0	0	0	0
Abies balsamea	0	2.5	0	0	0	0	0	0	0	0
Acer pensylvanicum	0.1	0	0.3	0	0	1.2	0	0	0	0

Table 14. Continued.

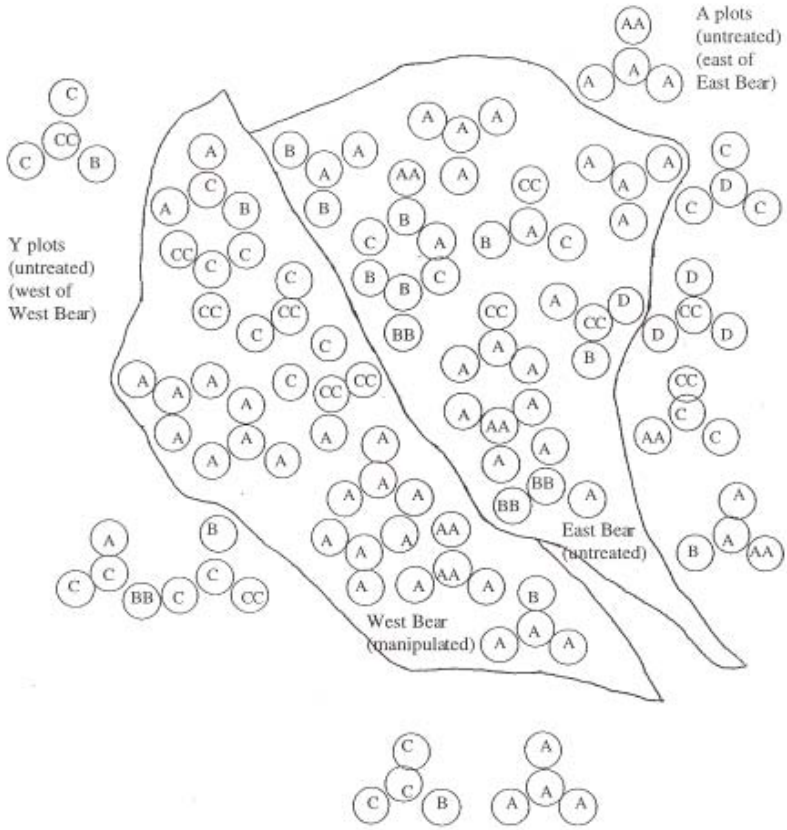
Species	A&Y -1	A&Y -2	A&Y -3	A&Y -4	A&Y -5	A&Y -6	A&Y -7	A&Y -8	A&Y -9	A&Y -10
	---------- Percentage abundance per 1m^2 ----------									
Acer rubrum	0	0	0	0	0	0	0.3	0	0	0
Acer saccharum	3.2	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	14.8	0.4	0	0	2.1	0.4	0.4	1.7	0	0.3
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	9.3	3.5	0	0	18.7	16.0	9.5	2.3	0.3	0.4
Fraxinus americana	0	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Picea rubens	0.1	3.8	1.0	13.0	0	0.3	1.1	1.3	0.9	5.8
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	1.8	0	0	0	0	0	0
Tsuga canadensis	0	0	0	0	0	0	0	0	0	0
snag	0	1.1	0.8	0.3	0	0	0.6		0.3	0.8
dead red spruce branches	0	0.2	0.3	0.7	0	0	1.1	0.8	0.1	0
downed log (>10 cm)	0	0	0	0	0	0.6	0	0	0	0
tip-up mound	0	0	0.5	0	0	0	0	0	0	0
Total	27.3	11.5	2.8	15.8	21.8	18.5	12.9	6.1	1.5	7.4
Strata 3 (1.8–4.9m)										
Abies balsamea	0	7.3	0	0	0	0	0	0	0	0
Acer pensylvanicum	1.9	0	0	0	0	0	0.3	0	0	0
Acer rubrum	0	0	0.8	0	0	0	3.6	2.1	0	0
Acer saccharum	1.4	0	0	0	7.9	0	0	0	0	0
Betula alleghaniensis	2.0	1.0	0	0	1.7	0	0	0	3.3	1.3
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	27.2	10.3	0	0	33.9	27.0	6.2	2.9	12.8	1.3
Fraxinus americana	0	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0.4
Picea rubens	5.8	2.8	0.8	15.1	0.4	1.7	8.5	8.3	8.2	5.4
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0.2	0	0	0	0	0	1.5
snag	0	1.0	0.2	0	0	0	0	0	0	0
dead red spruce branches	0	2.0	2.2	5.0	0	0.3	4.3	2.8	2.6	3.3
Total	38.3	24.3	3.8	20.3	43.9	29.0	22.8	16.2	26.8	13.2
Strata 4 (>4.9m)										
Abies balsamea	0	0	14.2	0	0	0	0	0	0	0
Acer pensylvanicum	5.4	0	0.3	0	0	0	1.7	2.9	0	1.7
Acer rubrum	0	7.1	0.8	7.5	0	0	16.7	29.6	11.3	4.8
Acer saccharum	18.3	0	0	0	24.3	10.4	2.1	0	5.0	0
Betula alleghaniensis	13.3	19.2	7.1	10.4	0	14.2	0	7.1	8.2	13.8
Fagus grandifolia	53.6	5.4	5.4	0	27.5	49.8	4.6	5.8	5.8	0
Fraxinus americana	0	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	1.7
Picea rubens	8.3	33.3	33.3	41.7	2.5	10.0	35.7	29.5	27.1	47.4
Pinus strobus	0	6.7	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	4.0	0	0	0	0	0	2.1
snag	0	0.5	0	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	1.2	0.3	0
Total	99.0	72.1	61.2	63.6	54.3	84.3	60.7	76.1	57.6	71.4

and 8%) in the three treatment areas were sawtimber size, the majority were poletimber size. In West Bear this deciduous forest-type extended more than half way up the watershed (295 to 395 m elevation) and then was found again at the summit of Lead Mountain (430 to 450 m) (Figure 6). A similar pattern held for A&Y, where this forest-type was found on the lower elevations (280 to 350 m) and reappeared again at small localized summit areas found at mid-elevations (390 m) on both the east and west sides of Lead Mountain. In East Bear this forest-type ranged from the lower elevations (310 m) almost to the summit (435 m).

In West Bear *A. saccharum, F. grandifolia,* and *B. alleghaniensis* trees constituted between 43% and 100% of the trees tallied in each of the 26 subplots designated as this forest-type (only four subplots had below 71% of these three tree species). In East Bear between 33% and 100% of all the trees tallied in the 23 subplots designated as this forest-type were *A. saccharum, F. grandifolia,* or *B. alleghaniensis* (only four subplots had less than 50%). In A&Y, between 50% and 100% of the trees tallied in the 13 subplots were either *A. saccharum, F. grandifolia,* or *B. alleghaniensis* (only one subplot had less than 73%). Other tree species associated with this forest-type that were found in the subplots at BBWM included *A. rubrum*, *A. pensylvanicum, P. rubens*, *Fraxinus americana* L. (white ash) and *Sorbus americana* Marshall (American mountain-ash).

The slopes on the lower elevations of West Bear, East Bear, and A&Y, where this forest-type is most prevalent, are all moderate, ranging from 8% to 42%. The gentlest slopes, between 8% and 25%, reflect topographic bench areas in West Bear (location of plot W-7) and East Bear (location of plot E-1). The steepest slopes where this forest-type is found are at the higher elevations in East Bear (location of plots E-9 and E-10); slopes in these areas range from 20% to 42%.

Acer rubrum */ northern hardwoods forest-type.* The highest percentage of *A. rubrum*/northern hardwoods forest-type was found in East Bear (25%), in which it covered nearly twice as much area as in A&Y (13%) and five times as much as in West Bear (5%) (Table 15). The majority of the subplots were poletimber size. The distribution of this forest-type was very scattered (Figure 6). In West Bear it was found in two small areas, one near the summit (450 m) and the other at a lower elevation (320 m). In East Bear and A&Y, this forest-type was found in several areas from the lower elevations (310–320 m) all the way up to very close to the summit (440 m).



A *Acer saccharum/Fagus grandifolia/Betula alleghaniensis* - poletimber
AA *Acer saccharum/Fagus grandifolia/Betula alleghaniensis* - sawtimber
B *Acer rubrum*/northern hardwoods - poletimber
BB *Acer rubrum*/northern hardwoods - sawtimber
C *Picea rubens* - poletimber
CC *Picea rubens* - sawtimber
D *Picea rubens/Abioes balsamea* - poletimber

Figure 6. Forest-types and stand sizes at Bear Brook Watershed in Maine in 1997 based on subplot analysis.

In West Bear *A. rubrum* and northern hardwood tree species constituted 51% and 77% of the trees tallied in the two subplots designated as this forest-type. In East Bear between 59% and 100% of all the trees tallied in the ten subplots designated as this forest-type were *A. rubrum* or northern hardwood tree species (only two subplots had less than 70% hardwoods). In A&Y, between 54% and 100% of the trees tallied in the five subplots were either *A. rubrum* or northern hardwood tree species (only two subplot had less than 70%). *A. rubrum*/northern hardwoods forest-type at BBWM included a wide variety of associated tree species including *A. saccharum, F. grandifolia,* and *B. alleghaniensis*, *A. pensylvanicum, S. americana*, *P. rubens*, and *Abies balsamea* (L.) Miller (balsam fir).

The slopes in the upper middle elevations of East Bear (where this forest-type was most prevalent) and at the summit of West Bear were moderate ranging from 3% to 42%. The gentlest slopes, from 3% to 8%, were found on a topographic bench area in East Bear (where plot E-6 was located). The steepest slopes, 33% to 53%, were found near the small summit in A&Y.

Picea rubens *forest-type. Picea rubens* forest-type covered almost one-third of West Bear (30%). East Bear had the lowest percentage (16%) of subplots in this forest-type; A&Y had the highest percentage (45%) (Table 15). Between 8% and 12% of the subplots were sawtimber size, the balance were poletimber. *Picea rubens* forest-type was found in the upper elevations (near the summit of Lead Mountain) of West Bear (between 370 and 430 m) and A&Y (440 m) (Figure 6). It was also found near the smaller summits in A&Y (370 and 405 m) and again at lower elevations in A&Y (320 to 370 m). In East Bear this forest-type was found scattered in small pockets on the landscape (360 to 410 m).

In West Bear *P. rubens* trees constituted 50% to 100% of the trees tallied in each of the 12 subplots designated as this forest-type (only two subplots had below 82% of this one tree species). In East Bear between 63% and 90% of all the trees tallied in the six subplots designated as this forest-type were *P. rubens* (five of the subplots were between 63% and 78%). In A&Y between 54% and 100% of all the trees tallied in the 18 subplots designated as this forest-type were *P. rubens* (six of the subplots had below 73%). Species associated with the *P. rubens* forest-type varied. For example, at BBWM this forest-type also included *F. grandifolia, B. alleghaniensis*, *A. rubrum*, *A. pensylvanicum, S. americana*, *Quercus rubra* (L.) (northern red oak), *Pinus strobus* L. (white pine), *Betula populifolia* Marshall (gray birch), and *Prunus serotina* Ehrh. (black cherry).

Table 15. Forest mensuration indicator: forest-type groups and stand tree sizes for the three treatment areas at Bear Brook Watershed in Maine in 1997 as determined using cluster-plots and subplots.

FHM forest-type group	Stand tree size	West Bear* # of plots	West Bear* %	East Bear # of plots	East Bear %	A & Y # of plots	A & Y %
Cluster-plot analysis							
Deciduous forest-types:							
sugar maple/beech/ yellow birch	poletimber[1]	6	60	6	60	3	30
red maple/northern hardwoods	poletimber[1]	1	10	4	40	1	10
Coniferous forest-types:							
red spruce	poletimber[1]	3	30	0	0	5	50
red spruce/balsam fir	poletimber[1]					1	10
Total deciduous		7	70	10	100	4	40
Total coniferous		3	30	0	0	6	60
Subplot analysis							
Deciduous forest-types:							
sugar maple/beech/ yellow birch	poletimber[1]	24	60	21	52	10	25
sugar maple/beech/ yellow birch	sawtimber[2]	2	5	2	5	3	8
Sub-total		26	65	23	57	13	33
red maple/northern hardwoods	poletimber[1]	2	5	7	17	4	10
red maple/northern hardwoods	sawtimber[2]	0	0	3	8	1	2
Sub-total		2	5	10	25	5	12
Coniferous forest-types:							
red spruce	poletimber[1]	7	18	3	8	14	35
red spruce	sawtimber[2]	5	12	3	8	4	10
Sub-total		12	30	6	16	18	45
red spruce/balsam fir	poletimber[1]	0	0	1	2	4	10
Total deciduous		28	70	33	82	18	45
Total coniferous		12	30	7	18	22	55

*Manipulated watershed.
[1]Poletimber: deciduous = 12.7 cm (5 in) and < 28 cm (10.9 in) DBH or conifer = 12.7 cm (5 in) and < 23 cm (8.9 in) dbh.
[2]Sawtimber: deciduous = 28 cm (11.0 in) dbh or conifer = 23 cm (9.0 in) dbh.

In general this forest-type was found on steep slopes: for example, from 18% to 52% in the middle to upper elevations of West Bear, 32% to 44% in A&Y near the summit of Lead Mountain, 17% to 50% near the lower summits in A&Y, and 16% to 52% on the lower elevations of A&Y.

Picea rubens/Abies balsamea *forest-type.* There was no *P. rubens / A. balsamea* forest-type found in West Bear and very little in East Bear (2%) (Table 15). This forest-type was most abundant in A&Y (10%). All the subplots in this forest-type were poletimber size. The locations in East Bear and A&Y were relatively close to one another located in the area of the small summit east of East Bear (370 to 405 m) (Figure 6).

This forest-type was not present in West Bear. In the one subplot in East Bear, 69% of all the trees tallied were *P. rubens* or *A. balsamea* trees. In A&Y between 95% and 96% of all the trees tallied in the four subplots designated as this forest-type were *P. rubens* or *A. balsamea* trees. Trees associated with this forest-type at BBWM also included *B. alleghaniensis*, *F. grandifolia,* and *Q. rubra.*

Deciduous forest-types

In stratum one (0–0.6 m above ground), 15 forb species were recorded in both West Bear and East Bear, and 12 forb species in A&Y (Table 16). The average abundance of forbs was lowest in West Bear (9% of the total area), slightly higher in East Bear, (11%), and highest in A&Y (16%). Randomization tests (also referred to as permutation tests) indicated no statistically significant difference (P-value 0.3) between the three treatment areas in the overall abundance of forbs in the deciduous forest-types. Six forb species constituted between 92% and 96% of the total cover for all the forbs (Table 17). These dominant forb species were *Aralia nudicaulis* L. (wild sarsaparilla), *Aster* spp. (aster), *Maianthemum canadense* Desf. (false lily of the valley), *Medeola virginiana* L. (Indian cucumber-root), *Trientalis borealis* Raf. (starflower), and *Uvularia sessilifolia* L. (wild oats). The average abundance of *Carex* spp. (sedge) and grasses combined were similar in all three treatment areas, covering approximately 1% of the each treatment area (Table 16).

In stratum one, six fern species were recorded in the deciduous forest-types in both West Bear and East Bear and four species were recorded in A&Y (Table 16). The most common fern in all three treatment areas was *Dryopteris campyloptera* Clarkson (mountain

Table 16. Vegetation structure indicator: stratum 1 frequency (percentage of plots in which a species occurred) and abundance (average percentage cover by species) of the plant species in the deciduous forest-types at Bear Brook Watershed in Maine in 1997.

Plant species Latin name	Common name	West Bear* Frequency: % of plots	West Bear* Abundance: avg. % cover	East Bear Frequency: % of plots	East Bear Abundance: avg. % cover	A&Y Frequency: % of plots	A&Y Abundance: avg. % cover
Forb species in the deciduous forest-type plots							
Aralia nudicaulis	wild sarsaparilla	71	2	50	2	100	6
Arisaema triphyllum	jack-in-the-pulpit	0	0	10	0.02	0	0
Aster spp.	aster	86	2	100	3	75	2
Clintonia borealis	clintonia	14	0.02	0	0	0	0
Coptis trifoliata	gold thread	14	0.01	20	0.3	50	0.3
Cornus canadensis	bunchberry	14	0.1	10	0.3	25	0.2
Fragaria virginiana	wild strawberry	0	0	10	0.04	0	0
Lycopodium spp.	club moss	0	0	10	0.01	0	0
Maianthemum canadense	false lily of the valley	71	1	80	1	50	0.9
Medeola virginiana	Indian cucumber-root	14	0.1	30	0.2	50	1
Polygonatum pubescens	hairy Solomon's seal	43	0.1	0	0	25	0.4
Polygonum convolvulus	black bindweed	29	0.01	30	0.04	0	0
Prenanthes alba	rattlesnake-root	14	0	10	0	0	0
Smilacina stellata	false Solomon's seal	0	0	0	0	25	0.1
Trientalis borealis	starflower	100	0.9	100	1	100	2
Trifolium spp.	clover	14	0.1	0	0	0	0
Trillium spp.	trillium	0	0	10	0.01	25	0.02
Trillum erectum	red trillium	14	0.2	0	0	0	0
Uvularia sessilifolia	wild oats	100	5	80	3	100	3
Viola spp.	violet	43	0.1	10	0.01	50	0.1
# of species and % of total area in forbs		15	9%	15	11%	12	16%

Table 16. Continued.

Plant species Latin name	Common name	West Bear* Frequency: % of plots	West Bear* Abundance: avg. % cover	East Bear Frequency: % of plots	East Bear Abundance: avg. % cover	A&Y Frequency: % of plots	A&Y Abundance: avg. % cover
Graminoids in the deciduous forest-type plots							
carex spp.	sedge	14	0.02	60	0.3	50	0.1
grass spp.	bunch grasses	14	1	10	0.04	25	0.3
grass spp.	grasses	57	0.2	60	0.7	50	0.9
% of total area in sedge and grass			1.4		1.0		1.2
Fern species in the deciduous forest-type plots							
Dennstaedtia punctilobula	hay-scented fern	14	0.1	10	0.04	25	0.4
Dryopteris campyloptera	mountain wood-fern	100	12	90	12	100	12
Gymnocarpium dryopteris	oak fern	71	2	10	0.1	0	0
Osmunda claytoniana	interrupted fern	0	0	20	2	0	0
Polystichum acrostichoides	Christmas fern	29	0.1	0	0	25	0.7
Thelypteris noveboracensis	New York fern	43	2	10	0.1	0	0
Thelypteris phegopteris	northern beech-fern	29	0.1	40	0.1	75	0.2
# of species and % of total area in ferns		6	16%	6	14%	4	13%
Shrub species in the deciduous forest-type plots							
Cornus alternifolia	alternate-leaved dogwood		0	0	10	0.1	0 0
Diervilla lonicera	bush-honeysuckle	0	0	10	0.02	0	0
Lonicera canadensis	fly-honeysuckle	14	0.1	30	0.2	25	0.2
Ribes glandulosum	skunk current	0	0	20	0.2	25	0.1
Rubus spp.	blackberry/raspberry	57	1	60	0.4	50	0.9
Vaccinium spp.**	blueberry	0	0	10	0.03	0	0
Viburnum acerifolium	flowering maple	14	0.1	10	0.01	25	0.01
Viburnum alnifolium	hobble-bush; moosewood		71	4	30	0.2	50 0.9
# of species and % of total area in shrubs		4	5%	8	1%	5	2%

Table 16. Continued.

Plant species Latin name	Common name	West Bear* Frequency: % of plots	West Bear* Abundance: avg. % cover	East Bear Frequency: % of plots	East Bear Abundance: avg. % cover	A&Y Frequency: % of plots	A&Y Abundance: avg. % cover
Tree species in the deciduous forest-type plots							
Abies balsamea	balsam fir	14	0.04	20	0.2	0	0
Acer pensylvanicum	striped maple	100	7	100	3	100	4
Acer rubrum	red maple	100	1	90	1	100	0.7
Acer saccharum	sugar maple	100	7	90	1	75	4
Betula alleghaniensis	yellow birch	86	2	90	4	100	3
Betula populifolia	gray birch	0	0	0	0	0	0
Fagus grandifolia	American beech	100	5	90	6	100	5
Fraxinus americana	white ash	0	0	10	0	0	0
Picea rubens	red spruce	100	1	90	2	75	1
Pinus strobus	Eastern white pine	0	0	0	0	0	0.0
Prunus serotina	black cherry	29	0.1	0	0	25	1
Prunus virginiana	choke-cherry	0	0	20	0.04	25	1
Quercus rubra	Northern red oak	14	0.02	0	0	0	0
Sorbus americana	American mountain ash	14	0.1	20	0.04	50	0.2
Tsuga canadensis	hemlock	0	0	10	1	0	0
Unknown cotelyden		29	0.03	30	0.02	50	0.03
# of species and % of total area in tree seedlings		11	22%	12	18%	10	20%
	lichen spp.	100	2	100	3	100	4
	moss spp.	100	2	100	5	100	7

*Manipulated watershed.

Table 17. Stratum 1: percentage contribution, based on abundance (percentage cover), of the dominant species in the deciduous forest-types at Bear Brook Watershed in Maine in 1997.

Species: Latin name	Common name	West Bear*	East Bear	A&Y
Forbs				
Aralia nudicaulis	wild sarsaparilla	14	20	35
Aster spp.	aster	17	26	15
Maianthemum canadense	false lily of the valley	10	11	6
Medeola virginiana	Indian cucumber-root	1	2	7
Trientalis borealis	starflower	9	11	10
Uvularia sessilifolia	wild oats	44	23	21
	Total	95	94	93
Ferns				
Dennstaedtia punctilobula	hay-scented fern	1	0	3
Dryopteris campyloptera	mountain wood-fern	72	86	90
Gymnocarpium dryopteris	oak fern	14	1	0
Osmunda claytoniana	interrupted fern	0	12	0
Polystichum acrostichoides	Christmas fern	1	0	6
Thelypteris noveboracensis	New York fern	12	0	0
	Total	100	99	98
Shrubs				
Lonicera canadensis	fly-honeysuckle	1	16	9
Ribes glandulosum	skunk current	0	21	5
Rubus spp.	blackberry/raspberry	24	35	47
Viburnum alnifolium	hobble-bush; moosewood	73	15	38
	Total	99	88	100
Trees				
Acer pensylvanicum	striped maple	30	16	22
Acer rubrum	red maple	3	7	3
Acer saccharum	sugar maple	32	8	19
Betula alleghaniensis	yellow birch	7	21	16
Fagus grandifolia	American beech	21	32	24
Picea rubens	red spruce	6	10	3
Prunus serotina	black cherry	0.2	0	7
	Total	99	94	95

*Manipulated watershed.

wood-fern), making up more than 72% of all the fern species present in West Bear and more than 86% and 90% of the all the ferns in East Bear and A&Y respectively (Table 17). The next most common fern varied by treatment area, in West Bear, *Gymnocarpium dryopteris* (L.) Newman (oak fern) and *Thelypteris noveboracensis* (L.) Nieuwl. (New York fern) made up over 14% and 12% of the ferns, respectively. In East Bear, *Osmunda claytoniana* L. (interrupted fern) made up 12% of the overall ferns; these were primarily found in plot E-6, which is on a topographic bench. In this area the soil moisture level is very high with lots of standing water, there was also sphagnum moss found in this area. There was no significant difference (P-value 0.9) between the treatment areas in fern abundance.

In stratum one, eight shrub species recorded or observed in the deciduous forest-types at BBWM (Table 16). The most common species were *Viburnum alnifollium* Marshall (hobble-bush or moosewood), *Rubus* spp. (blackberry and raspberry), *Ribes glandulosum* Grauer. (skunk current), and *Lonicera canadensis* Marshall (fly-honeysuckle) (Table 17). These species constituted between 88% and 100% of the shrubs in the deciduous forest-types. There was a significant difference (P-value 0.005) between the treatment areas in the percent cover of shrubs, with shrub abundance in West Bear (5% cover) significantly higher than in either East Bear (1%) or A&Y (2%).

Tree seedlings, saplings, and mature trees were not separated out in the data collection process. Hence tree species measurements incorporate all three age/size groups. In stratum one in the deciduous forest-types, 13 different tree species were recorded in at least one of the treatment areas (Table 16). The most common tree species were *F. grandifolia*, *P. rubens*, *A. pensylvanicum*, *A. rubrum*, *A. saccharum*, *B. alleghaniensis*, and *P. serotina*. In all three treatment areas, these species constituted between 95% and 99% of the tree species recorded (Table 17). There was no significant difference between the three treatment areas in overall tree species abundance in the deciduous forest-types (P-value 0.7).

In stratum one, lichens and mosses were both recorded in 100% of the deciduous forest-type plots (individual species were not determined) (Table 16). There was no significant difference between treatment areas in either lichen abundance (P-value 0.2) or moss abundance in the deciduous forest-types (P-value 0.08).

In stratum two (0.6–1.8 m above ground), two fern species were recorded *D. campyloptera* and *O. claytoniana* (Table 18). The abundance levels for both species were low. There were four shrub

species recorded, these were *V. alnifolium*, *Rubus* spp., *Cornus alternifolia* L.f. (alternate-leaved dogwood), and *L. canadensis*. Similar to the results in stratum one, shrub abundance was significantly different (P-value 0.004) between the treatment areas. Shrub abundance in West Bear (1.6% cover) was 32 and five times higher than the abundance in East Bear (0.05%) and A&Y (0.3%), respectively. The most common shrub in West Bear was *V. alnifolium*; this species was approximately three times more abundant than *Rubus* spp. or *C. alternifolia*. The most common tree species in stratum two were similar to those reported in stratum one. These included *F. grandifolia*, *A. pensylvanicum*, *A. rubrum*, *A. saccharum*, *B. alleghaniensis*, and *P. rubens*. Tree abundance in the deciduous forest-types ranged between 16% and 18% cover in the three treatment areas. There was no significant difference between treatment areas in tree abundance in the deciduous forest-types (P-value 0.9).

In stratum three (1.8–4.9 m above ground), trees were the only life form recorded. In the deciduous forest-types there were eight tree species recorded in West Bear and East Bear, and five species in A&Y (Table 19). The most common tree species in stratum three were *F. grandifolia*, *P. rubens*, *A. saccharum*, *B. alleghaniensis*, and *A. pensylvanicum*. In the deciduous forest-types tree abundance ranged between 25% and 34% cover in the three treatment areas. There was no significant difference between the treatment areas in the overall tree abundance in the deciduous forest-types (P-value 0.3).

In stratum four (>4.9 m above ground), trees were again the only life form recorded. In the deciduous forest-types there were between six and ten tree species recorded in the three treatment areas (Table 19). The most common tree species in stratum four included *F. grandifolia*, *P. rubens*, *A. saccharum*, *B. alleghaniensis*, *A. rubrum*, and *A. pensylvanicum*. The overall abundance for the deciduous forest-types ranged between 72% and 76% cover. There was no significant difference between the treatment areas in the overall tree abundance (P-value 0.8).

Coniferous forest-types

In stratum one (0–0.6 m above ground), the diversity of forb species in West Bear decreased from 15 species recorded in the deciduous forest-type to five species in the coniferous forest-types (Table 20). In contrast, there were 11 species recorded in A&Y in the coniferous forest-types. The overall forb abundance was very low in both West Bear and A&Y, only 3% in each area. There was no

Table 18. Vegetation structure indicator: stratum 2 frequency (percentage of plots in which a species occurred) and abundance (average percentage cover by species) of the ferns, shrubs, and trees in the deciduous forest-types at Bear Brook Watershed in Maine in 1997.

Plant species Latin name	Common name	West Bear* Frequency: % of plots	West Bear* Abundance: avg. % cover	East Bear Frequency: % of plots	East Bear Abundance: avg. % cover	A&Y Frequency: % of plots	A&Y Abundance: avg. % cover
Ferns							
Osmunda claytoniana	interrupted fern	29	0.1	10	1	0	0
# of species and % of total	area in ferns	1	0.1%	1	1%	0	0%
Shrubs							
Cornus alternifolia	alternate-leaved dogwood	14	0.3	10	0.03	0	0
Rubus spp.	blackberry/raspberry	29	0.3	10	0.02	0	0
Viburnum alnifolium	hobble-bush; moosewood	57	1	0	0	25	0.3
# of species and % of total	area in shrubs	3	1.6%	2	0.05%	1	0.3%
Trees							
Abies balsamea	balsam fir	0	0	0.2	0.05	0	0
Acer pensylvanicum	striped maple	86	3	40	0.9	50	0.3
Acer rubrum	red maple	29	1	40	0.2	0	0
Acer saccharum	sugar maple	86	3	20	0.5	25	1
Betula alleghaniensis	yellow birch	57	1	70	3.48	75	4
Fagus grandifolia	American beech	100	8	100	8.8	100	11
Fraxinus americana	white ash	14	0.2	20	0.05	0	0
Picea rubens	red spruce	14	2	50	2	75	0.3
Tsuga canadensis	hemlock	0	0	10	0.2	0	0
# of species and % of total	area in trees	7	18%	9	16%	5	17%

*Manipulated watershed.

Table 19. Vegetation structure indicator: strata 3 and 4 frequency (percentage of plots in which a species occurred) and abundance (average percentage cover by species) of the tree species in the deciduous forest-types at Bear Brook Watershed in Maine in 1997.

Plant species Latin name	Common name	West Bear* Frequency: % of plots	West Bear* Abundance: avg. % cover	East Bear Frequency: % of plots	East Bear Abundance: avg. % cover	A&Y Frequency: % of plots	A&Y Abundance: avg. % cover
Stratum 3							
Abies balsamea	balsam fir	0	0	10.0	0.1	0	0
Acer pensylvanicum	striped maple	29	1	30	2	25	0.5
Acer rubrum	red maple	14	1	20	0.1	0	0
Acer saccharum	sugar maple	29	3	60	3	50	2
Betula alleghaniensis	yellow birch	29	1	60	2	75	2
Fagus grandifolia	American beech	100	20	100	15	100	25
Fraxinus americana	white ash	14	0.3	10	0.3	0	0
Picea rubens	red spruce	43	3	80	3	100	4
Prunus serotina	black cherry	14	0.5	0	0	0	0
Sorbus americana	American mountain ash	14	0.2	10	0.2	0	0
# of species and % of total area in trees		9	28%	9	25%	5	34%
Stratum 4							
Abies balsamea	balsam fir	14	1	10.0	1	0	0
Acer pensylvanicum	striped maple	57	2	20	0.5	25	1
Acer rubrum	red maple	43	3	70	8	25	3
Acer saccharum	sugar maple	86	21	80	9	100	15
Betula alleghaniensis	yellow birch	71	7	70	11	75	9
Fagus grandifolia	American beech	100	38	100	26	100	34
Fraxinus americana	white ash	0	0	10	1	0	0
Picea rubens	red spruce	86	6	100	15	100	12
Sorbus americana	American mountain ash	0	0	10	0.4	0	0
# of species and % of total area in trees		7	76%	9	72%	6	74%

*Manipulated watershed.

Table 19. Vegetation structure indicator: strata 3 and 4 frequency (percentage of plots in which a species occurred) and abundance (average percentage cover by species) of the tree species in the deciduous forest-types at Bear Brook Watershed in Maine in 1997.

Plant species Latin name	Common name	West Bear* Frequency: % of plots	West Bear* Abundance: avg. % cover	East Bear Frequency: % of plots	East Bear Abundance: avg. % cover	A&Y Frequency: % of plots	A&Y Abundance: avg. % cover
Stratum 3							
Abies balsamea	balsam fir	0	0	10	0.1	0	0
Acer pensylvanicum	striped maple	29	1	30	2	25	0.5
Acer rubrum	red maple	14	1	20	0.1	0	0
Acer saccharum	sugar maple	29	3	60	3	50	2
Betula alleghaniensis	yellow birch	29	1	60	2	75	2
Fagus grandifolia	American beech	100	20	100	15	100	25
Fraxinus americana	white ash	14	0.3	10	0.3	0	0
Picea rubens	red spruce	43	3	80	3	100	4
Prunus serotina	black cherry	14	0.5	0	0	0	0
Sorbus americana	American mountain ash	14	0.2	10	0.2	0	0
# of species and % of total area in trees		9	28%	9	25%	5	34%
Stratum 4							
Abies balsamea	balsam fir	14	1	10	1	0	0
Acer pensylvanicum	striped maple	57	2	20	0.5	25	1
Acer rubrum	red maple	43	3	70	8	25	3
Acer saccharum	sugar maple	86	21	80	9	100	15
Betula alleghaniensis	yellow birch	71	7	70	11	75	9
Fagus grandifolia	American beech	100	38	100	26	100	34
Fraxinus americana	white ash	0	0	10	1	0	0
Picea rubens	red spruce	86	6	100	15	100	12
Sorbus americana	American mountain ash	0	0	10	0.4	0	0
# of species and % of total area in trees		7	76%	9	72%	6	74%

*Manipulated watershed.

significant difference (P-value 0.8) between the treatment areas in forb abundance. In West Bear, three forb species, *Aster* spp. *T. borealis*, and *U. sessilifolia* constituted 98% of the total forb abundance (Table 21). In A&Y abundance was spread among several different forb species.

Abundance of *Carex* spp. and grass in stratum one in the coniferous forest-type, relative to the deciduous forest-types, decreased in West Bear, but increased in A&Y (Table 20). The increase in A&Y may have been due to more plots randomly falling into the two lower summit areas within this treatment area. Summit areas had a much more open overstory canopy and a visibly higher percentage of grasses. There was no significant difference between the treatment areas in the abundance of graminoids in the coniferous forest-types (P-value 0.4).

In stratum one, in the coniferous forest-types only two and one fern species were present in West Bear and A&Y, respectively (Table 20). As in the deciduous forest-types, *D. campyloptera* was the most common species in A&Y; however, it was not recorded at all in West Bear (Table 21). There was no significant difference (P-value 0.2) in fern abundance between treatment areas. There were no shrubs recorded at all in West Bear and only one percent cover recorded in A&Y (Table 20). This difference was not statistically significant (P-value 0.2).

In stratum one, ten tree species were recorded in either West Bear or A&Y or both areas (Table 20). The most common tree species were *P. rubens*, *P. strobus*, *A. pensylvanicum*, *B. alleghaniensis*, *A. rubrum*, *F. grandifolia*, *A. saccharum*, and *S. americana.* These species constituted between 93% and 100% of the tree species recorded in A&Y and West Bear, respectively (Table 21). The differences between the two treatment areas were not significant (P-value 0.5).

In stratum one, lichens and mosses were both recorded in 100% of the coniferous forest-type plots (individual species were not determined) (Table 20). There was no significant difference between West Bear and A&Y in abundance of either lichens (P-value 0.8) or moss (P-value 0.5).

In stratum two (0.6–1.8 m above ground), trees were the only life form recorded in the coniferous forest-types. Three tree species were recorded in West Bear and five species in A&Y (Table 22). The most common tree species, similar to stratum one, included *F. grandifolia*, *P. rubens,* and *B. alleghaniensis, A. pensylvanicum,* and *A. rubrum*. Overall tree abundance was lower in the coniferous forest-types (between 4% and 8% cover) than in the deciduous

Table 20. Vegetation structure indicator: stratum 1 frequency (percentage of plots in which a species occurred) and abundance (average percentage cover by species) of the plant species in the coniferous forest-type plots at Bear Brook Watershed in Maine in 1997.

Plant species Latin name	Common name	West Bear* Freq. % of plots	West Bear* Abund. avg. % cover	A&Y Freq. % of plots	A&Y Abund. avg. % cover
Forb species					
Aralia nudicaulis	wild sarsaparilla	0	0	17	0.1
Aster spp.	aster	67	1	17	0.1
Clintonia borealis	clintonia	0	0	17	0.01
Cornus canadensis	bunchberry	0	0	17	0.2
Lycopodium spp.	club moss	0	0	17	0.1
Maianthemum canadense	false lily of the valley	67	0.03	67	0.8
Medeola virginiana	Indian cucumber-root	0	0	17	0.3
Polygonatum pubescens	hairy Solomon's seal	33	0.1	0	0
Polygonum convolvulus	black bindweed	0	0	17	0.01
Trientalis borealis	starflower	33	0.2	83	0.6
Uvularia sessilifolia	wild oats	33	2	50	0.3
Viola spp.	violet	0	0	17	0.01
# of species and % of total area in forbs		5	3%	11	3%
Graminoids					
carex spp.	sedge	0	0	50	0.1
grass spp.	bunch grasses	0	0	50	1.4
grass spp.	grasses	67	0.01	17	0.04
% of total area in sedge and grass			0.01		1.6
Fern species					
Dennstaedtia punctilobula	hay-scented fern	33	2	0	0
Dryopteris campyloptera	mountain wood-fern	0	0	67	11
Thelypteris phegopteris	northern beech-fern	33	0.5	0	0
# of species and % of total area in ferns		2	3%	1	11%
Shrub species					
Ribes glandulosum	skunk current	0	0	17	0.6
Rubus spp.	blackberry/raspberry	0	0	17	0.6
Vaccinium spp.	blueberry	0	0	17	0.3
# of species and % of total area in shrubs		0	0%	3	1%

Table 20. Continued.

Plant species Latin name	Common name	West Bear* Freq. % of plots	West Bear* Abund. avg. % cover	A&Y Freq. % of plots	A&Y Abund. avg. % cover
Tree species					
Abies balsamea	balsam fir	0	0	33	0.1
Acer pensylvanicum	striped maple	67	1	67	1
Acer rubrum	red maple	67	0.1	100	1
Acer saccharum	sugar maple	33	0.3	33	0.2
Betula alleghaniensis	yellow birch	100	1	83	1
Betula populifolia	gray birch	0	0.0	17	0.1
Fagus grandifolia	American beech	67	0.3	67	1
Fraxinus americana	white ash	0	0	17	0.1
Picea rubens	red spruce	100	4	83	2
Pinus strobus	Eastern white pine	0	0	17	3
Quercus rubra	Northern red oak	0	0	50	0.4
Sorbus americana	American mountain ash	33	0.04	33	1
Unknown cotelyden		0	0	50	0.02
# of species and % total area in seedlings		7	6%	11	10%
	lichen spp.	100	2	100	3
	moss spp.	100	6	100	7

*Manipulated watershed.

forest-types (between 16% and 18% cover). There was no significant difference between West Bear and A&Y in the overall tree abundance in the coniferous forest-types (0.2).

In stratum three (1.8–4.9 m above ground), trees were the only life form recorded. In the coniferous forest-types there were two tree species recorded in West Bear and eight in A&Y (Table 22). The most common tree species were similar to those in the previous strata, including *P. rubens*, *F. grandifolia*, *A. rubrum*, and *B. alleghaniensis*. Also similar to previous strata, overall abundance was lower in the coniferous forest-types (between 13% and 14% cover) than in the deciduous forest-types (between 25% and 34% cover). There was no significant difference between the treatment areas in the overall tree abundance in the coniferous forest-types (P-value 0.9).

In stratum four (>4.9 m above ground), trees were the only life form recorded in the coniferous forest-types. There were six species recorded in West Bear and ten tree species recorded in A&Y (Table 22). The most common tree species in stratum four were *P. rubens*, *F. grandifolia*, *A. rubrum*, *B. alleghaniensis*, and *A. pensylvanicum*. The overall abundance was very similar for both the coniferous

Table 21. Stratum 1: percentage contribution, based on abundance (percentage cover), of the dominant species in the coniferous forest-types at Bear Brook Watershed in Maine in 1997.

Species: Latin name	Common name	West Bear*	A&Y
Forbs			
Aralia nudicaulis	wild sarsaparilla	0	2
Aster spp.	aster	38	5
Maianthemum canadense	false lily of the valley	1	29
Medeola virginiana	Indian cucumber-root	0	13
Trientalis borealis	starflower	5	25
Uvularia sessilifolia	wild oats	55	13
	Total	98	87
Ferns			
Dennstaedtia punctilobula	hay-scented fern	81	0
Dryopteris campyloptera	mountain wood-fern	0	100
Gymnocarpium dryopteris	oak fern	0	0
Osmunda claytoniana	interrupted fern	0	0
Polystichum acrostichoides	Christmas fern	0	0
Thelypteris noveboracensis	New York fern	0	0
	Total	81	100
Shrubs			
Ribes glandulosum	skunk current	0	22
Rubus spp.	blackberry/raspberry	0	53
Vaccinium spp.	blueberry	0	25
	Total	0	100
Trees			
Acer pensylvanicum	striped maple	10	13
Acer rubrum	red maple	2	14
Acer saccharum	sugar maple	6	2
Betula alleghaniensis	yellow birch	13	5
Fagus grandifolia	American beech	5	8
Picea rubens	red spruce	63	19
Pinus strobus	Eastern white pine	0	26
Sorbus americana	Am. mountain ash	1	5
	Total	100	93

*Manipulated watershed.

Table 22. Vegetation structure indicator: Stratum 4 frequency (percentage of plots in which a species occurred) and abundance (average percentage cover by species) of the tree species in the coniferous forest-type plots at Bear Brook Watershed in Maine in 1997.

Plant species Latin name	Common name	West Bear* Freq. % of plots	West Bear* Abund. avg. % cover	A&Y Freq. % of plots	A&Y Abund. avg. % cover
Stratum 2					
Abies balsamea	balsam fir	0	0	17	0.4
Acer pensylvanicum	striped maple	0	0	33	0.04
Acer rubrum	red maple	0	0	17	0.04
Betula alleghaniensis	yellow birch	33	1	67	0.5
Fagus grandifolia	American beech	100	2	67	3
Picea rubens	red spruce	33	1	100	4
Sorbus americana	American mountain ash	0	0	17	0.3
# of species and % of total area in trees		3	4%	5	8%
Stratum 3					
Abies balsamea	balsam fir	0	0	17	1
Acer pensylvanicum	striped maple	0	0	17	0.04
Acer rubrum	red maple	0	0	50	1
Betula alleghaniensis	yellow birch	0	0	33	0.4
Fagus grandifolia	American beech	100	7	67	3
Picea rubens	red spruce	100	7	100	7
Quercus rubra	Northern red oak	0	0	17	0.1
Sorbus americana	American mountain ash	0	0	33	0.3
# of species and % of total area in trees		2	14%	8	13%
Stratum 4					
Abies balsamea	balsam fir	0	0	17	2
Acer pensylvanicum	striped maple	67	2	67	1
Acer rubrum	red maple	67	2	100	11
Acer saccharum	sugar maple	33	3	17	0.3
Betula alleghaniensis	yellow birch	67	3	83	10
Fagus grandifolia	American beech	100	7	67	4
Picea rubens	red spruce	100	55	100	37
Pinus strobus	Eastern white pine	0	0	17	1
Quercus rubra	Northern red oak	0	0	17	0.3
Sorbus americana	American mountain ash	0	0	33	1
# of species and % of total area in trees		6	72%	10	67%

*Manipulated watershed.

forest-types, between 67% and 72% cover, and the deciduous forest-types, between 72% and 76% cover. There was no significant difference between the treatment areas in the overall tree abundance in the coniferous forest-types (0.5).

General Health and Tree Reproduction

Damage indicator results

Trees: damage types. Up to three damage signs or symptoms were assessed for each live tree and sapling recorded in the forest mensuration indicator. In the following analysis the three damages are referred to as the 1st, 2nd, and 3rd damage. Tables 23–25 are summaries, by species and damage types, of the 1st, 2nd, and 3rd damages, respectively, recorded on live trees at BBWM in 1997. Tables 26–28 are summaries of the 1st, 2nd, and 3rd damages, respectively, recorded on saplings at BBWM in 1997.

Results of the 1st damage indicated that 45% of the trees in West Bear, 40% in East Bear, and 61% in A&Y had no damage signs or symptoms present anywhere on the tree (Table 29). For all tree species combined, the damage type with the highest occurrence in all three treatment areas was cankers. This was followed by conks and other indicators of advanced decay, open wounds, loss of terminal leader, broken bole or roots (less than 0.9 m from the bole), resinosis or gummosis, broken or dead branches, damaged foliage or shoots, and other miscellaneous damage. For both the 2nd and 3rd damages, for all tree species combined, the percentage of trees in the no damage category increased in all three treatment areas, to between 66% and 69% in West Bear, around 60% in East Bear, and between 76% and 80% in A&Y. The increase in trees with no damage corresponded with reduced percentages in all the other damage categories, except the cankers category in which the percentages remained the same.

By individual species, results of the 1st damage recorded for *A. rubrum*, *A. saccharum*, and *B. alleghaniensis* indicated that in all three treatment areas between 30% and 57% of the trees had no signs of damage present anywhere on the tree (Table 29). For each of these three species, the damage type with the highest occurrence in all three treatment areas was conks, fruiting bodies, and other indicators of advanced decay; between 34% and 65% of the trees in the three treatment areas had this type of damage. The distribution of *A. rubrum*, *A. saccharum* and *B. alleghaniensis* with conks, fruiting bodies, and advanced decay was scattered throughout the areas where these species occurred. In the 2nd and 3rd damages, the

Table 23. Damage and catastrophic mortality indicator: number of live trees, by species, in each of the FHM damage categories, based on the first damage recorded, at Bear Brook Watershed in Maine in 1997..

Species	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%)(3)	resinosis/ gummosis (4)	broken bole/root (<3' from bole)(11)	dead terminal leader (21)	dead branches (>20%) (22)	damaged foliage (24)	other (31)
West Bear*										
Abies balsamea	1	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	5	0	4	1	0	0	0	0	0	0
Acer rubrum	4	0	4	0	0	0	0	0	0	0
Acer saccharum	23	1	36	5	0	0	0	0	0	0
Betula alleghaniensis	10	2	14	2	0	0	0	0	0	4
Betula populifolia	0	0	0	1	0	0	0	0	0	0
Fagus grandifolia	0	141	0	0	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0	0	0
Picea rubens	158	1	16	8	2	1	3	0	0	1
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	1	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	1	0	0	0	0	0	0	0
Total (450 trees)	202	145	75	17	2	1	3	0	0	5
East Bear										
Abies balsamea	4	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	1	0	1	0	0	0	0	0	0	0
Acer rubrum	29	0	29	0	0	0	1	1	0	0
Acer saccharum	12	0	13	1	0	0	0	0	0	0
Betula alleghaniensis	23	0	27	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	0	174	0	0	0	0	0	0	0	0
Fraxinus americana	1	0	0	0	0	0	0	0	0	0
Picea rubens	106	0	17	3	0	1	4	0	0	2

Table 23. Continued.

Species	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%)(3)	resinosis/ gummosis (4)	broken bole/root (<3' from bole)(11)	dead terminal leader (21)	dead branches (>20%) (22)	damaged foliage (24)	other (31)
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	2	0	0	0	0	0	0	0
Total (452 trees)	176	174	89	4	0	1	5	1	0	2
A&Y										
Abies balsamea	9	0	3	0	0	1	0	0	0	0
Acer pensylvanicum	0	0	8	1	0	1	0	0	0	0
Acer rubrum	20	0	20	2	0	0	0	0	0	0
Acer saccharum	6	0	13	1	0	0	0	0	0	0
Betula alleghaniensis	20	1	12	2	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	1	98	0	0	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0	0	0
Picea rubens	250	0	21	8	1	0	5	1	0	0
Pinus strobus	1	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Quercus rubra	2	0	0	0	0	0	0	0	1	0
Sorbus americana	0	0	2	0	0	0	0	0	0	0
Total (511 trees)	309	99	79	14	1	2	5	1	1	0

*Manipulated watershed.

[1]Numbers within parentheses = FHM damage code.

Table 24. Damage and catastrophic mortality indicator: number of live trees, by species, in each of the FHM damage categories, based on the second damage recorded, at Bear Brook Watershed in Maine in 1997.

Species	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%)(3)	resinosis/ gummosis (4)	broken bole/root (<3' from bole)(11)	dead terminal leader (21)	dead branches (>20%) (22)	damaged foliage (24)	other (31)
West Bear*										
Abies balsamea	1	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	8	0	0	1	0	0	0	1	0	0
Acer rubrum	7	0	0	1	0	0	0	0	0	0
Acer saccharum	61	0	1	2	0	0	1	0	0	0
Betula alleghaniensis	28	0	3	0	0	0	0	1	0	0
Betula populifolia	0	0	0	1	0	0	0	0	0	0
Fagus grandifolia	1	140	0	0	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0	0	0
Picea rubens	188	0	1	0	0	0	0	1	0	0
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	1	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	1	0	0
Total (450 trees)	295	140	5	5	0	0	1	4	0	0
East Bear										
Abies balsamea	4	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	2	0	0	0	0	0	0	0	0	0
Acer rubrum	59	0	0	1	0	0	0	0	0	0
Acer saccharum	22	1	2	1	0	0	0	0	0	0
Betula alleghaniensis	43	0	7	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	3	171	0	0	0	0	0	0	0	0
Fraxinus americana	1	0	0	0	0	0	0	0	0	0
Picea rubens	132	0	1	0	0	0	0	0	0	0

Table 24. Continued.

Species	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%)(3)	resinosis/ gummosis (4)	broken bole/root (<3' from bole)(11)	dead terminal leader (21)	dead branches (>20%) (22)	damaged foliage (24)	other (31)
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Sorbus americana	1	0	1	0	0	0	0	0	0	0
Total (452 trees)	267	172	11	2	0	0	0	0	0	0
A&Y										
Abies balsamea	10	0	3	0	0	0	0	0	0	0
Acer pensylvanicum	7	0	1	0	0	0	0	2	0	0
Acer rubrum	35	0	7	0	0	0	0	0	0	0
Acer saccharum	19	1	0	0	0	0	0	0	0	0
Betula alleghaniensis	31	0	4	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	1	98	0	0	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0	0	0
Picea rubens	280	0	4	0	0	0	2	0	0	0
Pinus strobus	1	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Quercus rubra	3	0	0	0	0	0	0	0	0	0
Sorbus americana	2	0	0	0	0	0	0	0	0	0
Total (511 trees)	389	99	19	0	0	0	2	2	0	0

*Manipulated watershed.

[1]Numbers within parentheses = FHM damage code.

Table 25. Damage and catastrophic mortality indicator: number of live trees, by species, in each of the FHM damage categories, based on the third damage recorded, at Bear Brook Watershed in Maine in 1997.

Species	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%)(3)	resinosis/ gummosis (4)	broken bole/root (<3' from bole)(11)	dead terminal leader (21)	dead branches (>20%) (22)	damaged foliage (24)	other (31)
West Bear*										
Abies balsamea	1	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	10	0	0	0	0	0	0	0	0	0
Acer rubrum	8	0	0	0	0	0	0	0	0	0
Acer saccharum	64	0	1	0	0	0	0	0	0	0
Betula alleghaniensis	32	0	0	0	0	0	0	0	0	0
Betula populifolia	0	0	1	0	0	0	0	0	0	0
Fagus grandifolia	2	139	0	0	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0	0	0
Picea rubens	190	0	0	0	0	0	0	0	0	0
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	1	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Sorbus americana	1	0	0	0	0	0	0	0	0	0
Total (450 trees)	309	139	2	0	0	0	0	0	0	0
East Bear										
Abies balsamea	4	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	2	0	0	0	0	0	0	0	0	0
Acer rubrum	60	0	0	0	0	0	0	0	0	0
Acer saccharum	26	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	49	0	1	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	3	171	0	0	0	0	0	0	0	0
Fraxinus americana	1	0	0	0	0	0	0	0	0	0
Picea rubens	133	0	0	0	0	0	0	0	0	0

Table 25. Continued.

Species	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%)(3)	resinosis/ gummosis (4)	broken bole/root (<3' from bole)(11)	dead terminal leader (21)	dead branches (>20%) (22)	damaged foliage (24)	other (31)
Pinus strobus	0	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0	0	0
Sorbus americana	2	0	0	0	0	0	0	0	0	0
Total (452 trees)	280	171	1	0	0	0	0	0	0	0
A&Y										
Abies balsamea	12	0	0	0	0	0	1	0	0	0
Acer pensylvanicum	9	0	0	0	0	0	0	1	0	0
Acer rubrum	42	0	0	0	0	0	0	0	0	0
Acer saccharum	19	0	0	1	0	0	0	0	0	0
Betula alleghaniensis	34	0	0	0	0	0	0	1	0	0
Betula populifolia	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	1	96	0	0	0	0	0	2	0	0
Fraxinus americana	0	0	0	0	0	0	0	0	0	0
Picea rubens	286	0	0	0	0	0	0	0	0	0
Pinus strobus	1	0	0	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0	0	0
Quercus rubra	3	0	0	0	0	0	0	0	0	0
Sorbus americana	2	0	0	0	0	0	0	0	0	0
Total (511 trees)	409	96	0	1	0	0	1	4	0	0

*Manipulated watershed.

[1]Numbers within parentheses = FHM damage code.

Table 26. Damage and catastrophic mortality indicator: number of live saplings, by species, in each of the FHM damage categories, based on the first damage recorded, at Bear Brook Watershed in Maine in 1997.

	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%) (3)	broken bole/root (<3' from bole) (11)	dead terminal leader (21)	dead branches (>20%) (22)	other (31)
West Bear*								
Abies balsamea	0	0	0	0	0	0	0	0
Acer pensylvanicum	1	0	0	0	0	0	1	1
Acer rubrum	0	0	0	0	0	0	0	0
Acer saccharum	3	0	3	0	0	0	0	0
Betula alleghaniensis	2	0	2	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0
Fagus grandifolia	0	37	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0
Picea rubens	8	1	0	0	0	2	3	0
Prunus serotina	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0
Total (64 saplings)	14	38	5	0	0	2	4	1
East Bear								
Abies balsamea	6	0	1	1	1	0	0	0
Acer pensylvanicum	0	0	1	0	0	0	0	0
Acer rubrum	1	0	1	1	0	0	0	0
Acer saccharum	2	0	0	0	0	0	0	0
Betula alleghaniensis	1	0	3	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0
Fagus grandifolia	0	38	0	0	1	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0
Picea rubens	8	0	0	0	0	1	0	1
Prunus serotina	0	0	0	0	0	0	0	0

Table 26. Continued.

	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%) (3)	broken bole/root (<3' from bole) (11)	dead terminal leader (21)	dead branches (>20%) (22)	other (31)
West Bear*								
Abies balsamea	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0
Sorbus americana	0	0	1	0	0	0	0	0
Total (69 saplings)	18	38	7	2	2	1	0	1
A&Y								
Abies balsamea	1	0	0	0	0	0	0	0
Acer pensylvanicum	0	0	1	0	0	0	1	0
Acer rubrum	3	0	1	0	0	0	0	0
Acer saccharum	0	0	0	0	0	0	0	0
Betula alleghaniensis	1	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0
Fagus grandifolia	0	22	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0
Picea rubens	11	0	0	0	0	2	0	0
Prunus serotina	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0
Sorbus americana	3	0	3	0	0	0	0	0
Total (49 saplings)	19	22	5	0	0	2	1	0

*Manipulated watershed.

[1]Numbers within parentheses = FHM damage code.

Table 27. Damage and catastrophic mortality indicator: number of live saplings, by species, in each of the FHM damage categories, based on the second damage recorded, at Bear Brook Watershed in Maine in 1997.

	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%) (3)	broken bole/root (<3' from bole) (11)	dead terminal leader (21)	dead branches (>20%) (22)	other (31)
West Bear*								
Abies balsamea	0	0	0	0	0	0	0	0
Acer pensylvanicum	3	0	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	0	0
Acer saccharum	5	0	0	1	0	0	0	0
Betula alleghaniensis	4	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0
Fagus grandifolia	0	37	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0
Picea rubens	13	1	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0
Total (64 saplings)	25	38	0	1	0	0	0	0
East Bear								
Abies balsamea	8	0	0	1	0	0	0	0
Acer pensylvanicum	0	0	0	0	0	0	1	0
Acer rubrum	2	0	0	0	0	1	0	0
Acer saccharum	2	0	0	0	0	0	0	0
Betula alleghaniensis	4	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0
Fagus grandifolia	0	38	0	1	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0
Picea rubens	10	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0

Table 27. Continued.

	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%) (3)	broken bole/root (<3' from bole) (11)	dead terminal leader (21)	dead branches (>20%) (22)	other (31)
Quercus rubra	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	1	0	0	0	0
Total (69 saplings)	26	38	0	3	0	1	1	0
A&Y								
Abies balsamea	1	0	0	0	0	0	0	0
Acer pensylvanicum	2	0	0	0	0	0	0	0
Acer rubrum	4	0	0	0	0	0	0	0
Acer saccharum	0	0	0	0	0	0	0	0
Betula alleghaniensis	1	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0
Fagus grandifolia	0	22	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0
Picea rubens	13	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0
Sorbus americana	6	0	0	0	0	0	0	0
Total (49 saplings)	27	22	0	0	0	0	0	0

*Manipulated watershed.
[1]Numbers within parentheses = FHM damage code.

Table 28. Damage and catastrophic mortality indicator: number of live saplings, by species, in each of the FHM damage categories, based on the third damage recorded, at Bear Brook Watershed in Maine in 1997

	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%) (3)	broken bole/root (<3' from bole) (11)	dead terminal leader (21)	dead branches (>20%) (22)	other (31)
West Bear*								
Abies balsamea	0	0	0	0	0	0	0	0
Acer pensylvanicum	3	0	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	0	0
Acer saccharum	6	0	0	0	0	0	0	0
Betula alleghaniensis	4	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0
Fagus grandifolia	2	34	0	0	0	1	0	0
Fraxinus americana	0	0	0	0	0	0	0	0
Picea rubens	14	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0
Sorbus americana	0	0	0	0	0	0	0	0
Total (64 saplings)	29	34	0	0	0	1	0	0
East Bear								
Abies balsamea	8	0	0	0	0	1	0	0
Acer pensylvanicum	1	0	0	0	0	0	0	0
Acer rubrum	3	0	0	0	0	0	0	0
Acer saccharum	2	0	0	0	0	0	0	0
Betula alleghaniensis	4	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0
Fagus grandifolia	5	34	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0
Picea rubens	10	0	0	0	0	0	0	0

Table 28. Continued.

	no damage (0)[1]	canker (>20%) (1)	conks & advanced decay (2)	open wounds (>20%) (3)	broken bole/root (<3' from bole) (11)	dead terminal leader (21)	dead branches (>20%) (22)	other (31)
Prunus serotina	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0
Sorbus americana	1	0	0	0	0	0	0	0
Total (69 saplings)	34	34	0	0	0	1	0	0
A&Y								
Abies balsamea	1	0	0	0	0	0	0	0
Acer pensylvanicum	2	0	0	0	0	0	0	0
Acer rubrum	4	0	0	0	0	0	0	0
Acer saccharum	0	0	0	0	0	0	0	0
Betula alleghaniensis	1	0	0	0	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0
Fagus grandifolia	2	20	0	0	0	0	0	0
Fraxinus americana	0	0	0	0	0	0	0	0
Picea rubens	13	0	0	0	0	0	0	0
Prunus serotina	0	0	0	0	0	0	0	0
Quercus rubra	0	0	0	0	0	0	0	0
Sorbus americana	6	0	0	0	0	0	0	0
Total (49 saplings)	29	20	0	0	0	0	0	0

*Manipulated watershed.

[1]Numbers within parentheses = FHM damage code.

Table 29. Damage and catastrophic mortality indicator: percentage of 1st, 2nd, and 3rd damage signs and symptoms recorded for the trees, all the species combined, and for the individual major dominant tree species at Bear Brook Watershed in Maine in 1997, listed in FHM priority.

Damage Sign Or Symptom	1st damage			2nd damage			3rd damage		
	West Bear*	East Bear	A&Y	West Bear*	East Bear	A&Y	West Bear*	East Bear	A&Y
	%								
All Species Combined									
no damage	44.9	38.9	60.5	65.8	59.1	76.1	68.7	61.9	80.0
cankers	32.2	38.5	19.4	31.1	38.1	19.4	30.9	37.8	18.8
conks, fruiting bodies, & decay	16.7	19.7	15.5	1.1	2.4	3.7	0.4	0.2	0
open wounds	3.8	0.9	2.7	1.1	0.4	0	0	0	0.2
loss of apical dominance	0.7	1.1	1.0	0.2	0	0.4	0	0	0.2
resinosis or gummosis	0.4	0	0.2	0	0	0	0	0	0
broken or dead branches	0	0.2	0.2	0.7	0	0.4	0	0	0.8
broken bole or roots	0.2	0.2	0.4	0	0	0	0	0	0
other	1.1	0.4	0.0	0	0	0	0	0	0
Acer rubrum									
no damage	50.0	48.3	47.6	87.5	98.3	83.3	100.0	100.0	100.0
conks, fruiting bodies, & decay	50.0	48.3	47.6	0	0	16.7	0	0	0
open wounds	0	0	4.8	12.5	1.7	0	0	0	0
loss of apical dominance	0	1.7	0	0	0	0	0	0	0
broken or dead branches	0	1.7	0	0	0	0	0	0	0
Acer saccharum									
no damage	35.4	46.2	30.0	93.8	84.6	95.0	98.5	100.0	95.0
conks, fruiting bodies, & decay	55.4	50.0	65.0	1.5	7.7	0	1.5	0	0
open wounds	7.7	3.8	5.0	3.1	3.8	0	0	0	5.0
cankers	1.5	0	0	0	3.8	5.0	0	0	0
loss of apical dominance	0	0	0	1.5	0	0	0	0	0

Table 29. Continued.

Damage Sign Or Symptom	1st damage			2nd damage			3rd damage		
	West Bear*	East Bear	A&Y	West Bear*	East Bear	A&Y	West Bear*	East Bear	A&Y
	%								
Betula alleghaniensis									
no damage	31.3	46.0	57.1	87.5	86.0	88.6	100.0	98.0	97.1
conks, fruiting bodies, & decay	43.8	54.0	34.3	9.4	14.0	11.4	0	2.0	0
open wounds	6.3	0.0	5.7	0	0	0	0	0	0
cankers	6.3	0.0	2.9	0	0	0	0	0	0
broken or dead branches	0	0	0	3.1	0	0	0	0	2.9
other	12.5	0	0	0	0	0	0	0	0
Fagus grandifolia									
no damage	0	0	1.0	0.7	1.7	1.0	1.4	1.7	1.0
cankers	100.0	100.0	99.0	99.3	98.3	99.0	98.6	98.3	97.0
broken or dead branches	0	0	0	0	0	0	0	0	2.0
Picea rubens									
no damage	83.2	79.7	87.4	98.9	99.2	97.9	100.0	100.0	100.0
conks, fruiting bodies, & decay	8.4	12.8	7.3	0.5	0.8	1.4	0	0	0
open wounds	4.2	2.3	2.8	0	0	0	0	0	0
loss of apical dominance	1.6	3.0	1.7	0	0	0.7	0	0	0
resinosis or gummosis	1.1	0	0.3	0	0	0	0	0	0
broken bole or roots	0.5	0.8	0	0	0	0	0	0	0
cankers	0.5	0	0	0	0	0	0	0	0
broken or dead branches	0	0	0.3	0.5	0	0	0	0	0
other	0.5	1.5	0	0	0	0	0	0	0

*Manipulated watershed.

A. rubrum, A. saccharum, and B. alleghaniensis in the no damage category increased to between 83% and 95%, and 95% and 100%, respectively.

Contingency table analysis of the individual dominant species indicated that there were no significant differences among West Bear and East Bear and A&Y for *A. rubrum* (P-value 0.6) or *A. saccharum* (P-value 0.9). However, there was a significant difference for *B. alleghaniensis* (P-value 0.02). In West Bear the number of trees with "other damages" was significantly larger than the expected frequency (Cell Chi Sq. 5.0). This damage generally involved two trees growing so close together that they were fusing at the base and one tree was essentially engulfing the other.

In the 1st, 2nd, and 3rd damages, in all three treatment areas, almost 100% of the *F. grandifolia* trees had one sign or symptom: cankers (Table 26). This is primarily the result of beech bark disease, which was introduced into the USA. Results of the 1st damage sign for *P. rubens* showed that *P. rubens* had both the highest percentage of trees with no damage (between 80% and 87% in the three treatment areas) and the highest diversity of damage types recorded (eight). Damage types recorded included conks, fruiting bodies, and advanced decay (between 7% and 13% in the three treatment areas); open wounds; loss of apical dominance; resinosis or gummosis; broken bole or roots; cankers; broken or dead branches; and other miscellaneous damages. Results of the 2nd damage indicated that between 98% and 99% of *P. rubens* trees in the three treatment areas had no signs of damage. In the 3rd damage, 100% of *P. rubens* trees had no damage. Contingency table analysis of these major dominant species indicated that there were no significant differences between West Bear and East Bear and A&Y for *P. rubens* (P-value 0.6), or *F. grandifolia* (P-value 0.2).

When the data were stratified by forest-type, contingency table analysis indicated that there was no significant difference (P-value 0.4) between West Bear and East Bear and A&Y in the distribution of damage signs in the conifer forest-type. However, in the deciduous forest-type, the distribution of damage signs was significantly different (P-value 0.01). In West Bear the number of trees with open wounds was significantly higher than the expected frequency (Cell Chi Sq. 7.8). About 30% of the open wounds occurred on *P. rubens*. These wounds were primarily old branch scars that resulted from self-pruning or situations where forking had resulted in two leaders but one was broken off. About 33% of the open wounds in West Bear occurred on *A. saccharum*, again some of these open wounds were

old branch scars. The balance of incidences of open wounds was spread out among the remaining tree species.

Trees: damage locations and severity. An actual location on the tree and a severity level (amount of affected area per location) were recorded for every damage recorded. In the following example, location and severity are discussed relative to the cankers recorded on all the *F. grandifolia*. In the 1st damage, for all three treatment areas, the most common location on the tree was the roots and lower bole (Table 30). The average percentage of this area affected was 80% to 89% in West Bear and 90% to 99% in both East Bear and A&Y. In the 2nd damage the most common location, upper bole (upper half of the trunk between the stump and the base of the live crown), and the average percentage of this area affected, 80% to 89%, was the same in all three treatment areas. In the 3rd damage the most common location, crownstem (the main stem above the base of the live crown), and the average percentage of this area affected, 70% to 79%, was also the same in all three treatment areas.

Saplings: damage types. Results of the 1st damage recorded indicated that, of all the sapling species combined, 22% of the saplings in West Bear, 26% in East Bear and 39% in A&Y had no damage signs or symptoms present (Table 31). For saplings (all species combined), in all three treatment areas the most common damage category was cankers, with 59% in West Bear, 55% in East Bear, and 45% in A&Y. Other damage categories that included relatively

Table 30. Damage and catastrophic mortality indicator: most common location and severity level (percentage of the area affected) of canker damages recorded for *Fagus grandifolia* trees at Bear Brook Watershed in Maine in 1997.

	1st most common location	damage severity avg. %	2nd most common location	damage severity avg. %	3rd most common location	damage severity avg. %
West Bear*	roots and lower bole	80–89	upper bole	80–89	crown-stem	70–79
East Bear	roots and lower bole	90–99	upper bole	80–89	crown-stem	70–79
A&Y	roots and lower bole	90–99	upper bole	80–89	crown-stem	70–79

*Manipulated watershed.

Table 31. Damage and catastrophic mortality indicator: percentage of 1st, 2nd, and 3rd damage signs and symptoms recorded for the saplings, all the species combined, and for *Fagus grandifolia* and *Picea rubens* saplings at Bear Brook Watershed in Maine in 1997.

Damage Sign Or Symptom	1st damage			2nd damage			3rd damage		
	West Bear*	East Bear	A&Y	West Bear*	East Bear	A&Y	West Bear*	East Bear	A&Y
	%								
All Species Combined									
no damage	22.0	26.0	39.0	39.1	37.7	55.1	45.3	49.3	59.2
cankers	59.0	55.0	45.0	59.4	55.1	44.9	53.1	49.3	40.8
conks, fruiting bodies, & decay	8.0	10.0	10.0	0	0	0	0	0	0
loss of apical dominance	3.0	1.0	4.0	0	1.4	0	1.6	1.4	0
broken or dead branches	6.0	0	2.0	0	1.4	0	0	0	0
open wounds	0	3.0	0	1.6	4.3	0	0	0	0
broken bole or roots	0	3.0	0	0	0	0	0	0	0
Fagus grandifolia									
no damage	0	0	0	0	2.6	0	5.4	12.8	9.1
cankers	100.0	97.4	100.0	100.0	94.9	100.0	91.9	87.2	90.9
open wounds	0	0	0	0	2.6	0	2.7	0	0
broken bole or roots (> 0.9m from bole)	0	2.6	0	0	0	0	0	0	0
Picea rubens									
no damage	57.0	80.0	85.0	98.4	100.0	100.0	100.0	100.0	100.0
broken or dead branches	21.0	0	0	0	0	0	0	0	0
loss of apical dominance	14.0	10.0	15.0	0	0	0	0	0	0
cankers	7.0	0	0	1.6	0	0	0	0	0
other	0	10.0	0	0	0	0	0	0	0

*Manipulated watershed.

small percentages of saplings were conks and advanced decay; dead terminal leader; broken or dead branches; broken bole or root; and other miscellaneous unidentified damages. In the 2nd damage, the percentages of saplings (all species combined) in the no damage category increased in all three treatment areas, 39% in West Bear, 38% in East Bear, and 55% in A&Y. The most common damage type in all three treatment areas was again cankers; between 45% and 59% of the saplings had cankers. The 3rd damage also included another increase in the percentage of saplings (all species combined) in the no damage category in all three treatment areas. The increase was primarily due to a slight decrease in the occurrence of cankers in each treatment area.

In the 1st damage, in all three treatment areas, almost all the *A. rubrum, A. saccharum,* and *B. alleghaniensis* saplings were in one of two categories: (1) no signs of damage or (2) the conks, fruiting bodies, and signs of advanced decay. The only exception was a few *A. rubrum* saplings with open wounds. The percentages of saplings that had no signs or symptoms of damage varied for *A. rubrum, A. saccharum,* and *B. alleghaniensis*. For *A. rubrum* 33% of the saplings in East Bear and 75% in A&Y had no signs of damage (there were no *A. rubrum* saplings recorded in West Bear). For *A. saccharum* 50% of the saplings in West Bear and 100% in East Bear had no signs or symptoms of damage (there were no *A. saccharum* saplings recorded in A&Y). For *B. alleghaniensis* 50% of the saplings in West Bear, 25% in East Bear, and 100% in A&Y had no signs or symptoms of damage.

Similar to the trees, in the 1st damage the high percentage of cankers amongst saplings was primarily related to *F. grandifolia*. In the three treatment areas between 97% and 100% of the *F. grandifolia* saplings had cankers (Table 31). The percentage of *F. grandifolia* saplings that had cankers was similar in the 2nd damage and dropped only slightly in the 3rd damage. Results of the 1st damage recorded for *P. rubens* indicated that 57% of the saplings inn West Bear had no signs or symptoms of damage compared with 80% and 85% of the *P. rubens* saplings in East Bear and A&Y, respectively. There were differences between the treatment areas in the types and amounts of damages. The most common damage type recorded in West Bear was broken or dead branches at 21%. This damage type was not recorded in East Bear or A&Y. Cankers were also recorded on *P. rubens* saplings in West Bear but not in East Bear or A&Y. The only damage type recorded in all three treatment areas was loss of apical dominance or dead terminal leader: 14%, 10%, and 15% in West Bear, East Bear, and A&Y

respectively. In the 2nd damage, in the three treatment areas, between 98% and 100% of the *P. rubens* saplings had no signs or symptoms of damage. In the 3rd damage, 100% of the saplings in all three treatment areas had no signs or symptoms of damage.

Saplings: damage locations and severity. The location of damages on saplings and the severity level (amount of area affected per location) were recorded for all the damages recorded on saplings. The location and severity level results for *F. grandifolia* saplings relative to cankers were similar to the results from the *F. grandifolia* trees. In all three treatment areas, the most common 1st damage location was the roots and lower bole. The most common 2nd damage location was the upper bole (upper half of the trunk between the stump and base of the live crown), and the most common 3rd damage location was the crownstem (the main stem above the base of the live crown) (Table 32). In the 1st, 2nd, and 3rd damage locations the severity ranged from 70% to 89% for all three treatment areas.

Tree seed production indicator results

Individual seed collection years of 1997–98 and 1998–99. In the summer of 1997 through winter of 1998 the total number of seeds collected in West Bear (121 seeds) was slightly lower than East Bear (126 seeds) and about half of what was collected in A&Y (230 seeds) (Table 33). The differences between the treatment areas were not statistically significant (P-value 0.7).

The number of seeds collected in the summer of 1998 through winter of 1999 in West Bear (6536 seeds), East Bear (8190 seeds),

Table 32. Damage and catastrophic mortality indicator: most common location and severity level (percentage of the area affected) of canker damages recorded for *Fagus grandifolia* saplings at Bear Brook Watershed in Maine in 1997.

	1st most common location	damage severity avg. %	2nd most common location	damage severity avg. %	3rd most common location	damage severity avg. %
West Bear*	roots and lower bole	80–89	upper bole	70–79	crown-stem	70–79
East Bear	roots and lower bole	80–89	upper bole	80–89	crown-stem	70–79
A&Y	roots and lower bole	80–89	upper bole	80–89	crown-stem	80–89

*Manipulated watershed.

Table 33. Tree seed production indicator: number of tree seeds per plot (sum of all four subplots within each cluster-plot), by species, at Bear Brook Watershed, Maine, in 1997.

Species	FHM Code	Number of tree seeds/plot										
		W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10	Total
Abies balsamea	012	0	0	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	315	1	2	6	0	1	1	0	0	0	2	13
Acer rubrum	316	2	0	2	0	3	1	0	0	1	23	32
Acer saccharum	318	0	1	0	0	0	0	0	0	0	0	1
Betula alleghaniensis	371	0	3	0	1	0	0	0	0	0	0	4
Betula populifolia	379	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	531	0	0	2	0	1	0	1	0	0	0	4
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	0	0	2	1	1	28	4	13	3	15	67
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		3	6	12	2	6	30	5	13	4	40	121
		E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10	Total
Abies balsamea	012	0	0	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	315	2	0	1	0	0	0	0	3	0	0	6
Acer rubrum	316	14	6	1	1	14	16	5	1	0	17	75
Acer saccharum	318	0	0	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	371	2	0	0	0	0	4	0	0	0	0	6
Betula populifolia	379	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	531	0	0	0	0	0	0	3	1	6	1	11
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	0	1	18	9	0	0	0	0	0	0	28
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		18	7	20	10	14	20	8	5	6	18	126
		A-1	A-2	A-3	A-4	A-5	Y-1	Y-2	Y-3	Y-4	Y-5	Total
Abies balsamea	012	0	0	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	315	11	0	0	0	0	3	20	0	7	1	42
Acer rubrum	316	1	0	2	0	0	1	21	96	16	9	146
Acer saccharum	318	0	0	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	371	2	1	1	0	0	0	1	1	0	1	7
Betula populifolia	379	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	531	0	0	0	0	0	0	0	0	0	0	0
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	0	0	4	3	0	0	3	4	18	3	35
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		14	1	7	3	0	4	45	101	41	14	230

Table 34. Tree seed production indicator: number of tree seeds per plot (sum of all four subplots within each cluster-plot), by species, at Bear Brook Watershed, Maine, in 1998.

Species	FHM Code	Number of tree seeds/plot										
		W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10	Total
Abies balsamea	012	30	0	0	0	0	0	0	0	2	0	32
Acer pensylvanicum	315	18	9	3	13	1	12	0	2	12	11	81
Acer rubrum	316	0	0	0	0	0	1	1	0	0	27	29
Acer saccharum	318	32	49	4	12	17	0	19	0	1	0	134
Betula alleghaniensis	371	465	492	668	625	269	568	116	44	144	1191	4582
Betula populifolia	379	1	2	1	4	3	2	0	1	4	25	43
Fagus grandifolia	531	25	7	13	7	2	0	5	0	0	0	59
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	34	40	27	50	74	143	75	259	560	314	1576
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		605	599	716	711	366	726	216	306	723	1568	6536
		E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10	Total
Abies balsamea	012	1	0	0	40	1	1	0	0	0	0	43
Acer pensylvanicum	315	3	3	2	13	5	4	1	25	3	0	59
Acer rubrum	316	17	1	0	1	1	12	1	0	0	4	37
Acer saccharum	318	16	4	11	2	0	6	6	0	11	4	60
Betula alleghaniensis	371	794	1180	1139	574	293	705	281	900	250	292	6408
Betula populifolia	379	3	2	21	9	6	4	5	11	3	28	92
Fagus grandifolia	531	9	13	2	15	1	0	18	18	24	6	106
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	78	186	45	730	185	37	43	58	0	23	1385
Pinus strobus	129	0	0	0	0	0	0	0	0	0	0	0
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		921	1389	1220	1384	492	769	355	1012	291	357	8190
		A-1	A-2	A-3	A-4	A-5	Y-1	Y-2	Y-3	Y-4	Y-5	Total
Abies balsamea	012	0	0	40	0	0	0	0	0	8	1	49
Acer pensylvanicum	315	12	0	2	0	0	31	14	1	3	2	65
Acer rubrum	316	0	0	1	1	0	0	10	4	8	17	41
Acer saccharum	318	11	0	1	0	47	4	12	1	0	0	76
Betula alleghaniensis	371	712	512	47	882	135	406	623	161	1172	549	5199
Betula populifolia	379	1	7	47	1	4	4	2	1	0	35	102
Fagus grandifolia	531	15	2	0	0	12	17	0	0	0	0	46
Fraxinus americana	541	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	097	70	91	412	304	29	23	240	257	75	320	1821
Pinus strobus	129	0	0	0	0	2	0	0	0	0	0	2
Prunus serotina	762	0	0	0	0	0	0	0	0	0	0	0
Prunus virginiana	763	0	0	0	0	0	0	0	0	0	0	0
Quercus rubra	833	0	0	0	0	0	0	0	0	0	0	0
Sorbus americana	935	0	0	0	0	0	0	0	0	0	0	0
Tsuga canadensis	261	0	0	0	0	0	0	0	0	0	0	0
TOTAL		821	612	550	1188	229	485	901	425	1266	924	7401

and A&Y (7401 seeds) was higher than the previous year (Table 34). Similar to 1997–98, the number of seeds collected in West Bear was lower than either East Bear or A&Y. Differences between the three treatment areas in total number of seeds collected were not statistically significant (P-value 0.5).

The majority of seeds collected in 1997–98 and 1998–99 were from the six major dominant tree species found at BBWM: *A. pensylvanicum*, *A. rubrum*, *A. saccharum*, *B. alleghaniensis*, *F. grandifolia*, and *P. rubens* (Table 35). In 1997–98, between 26% and 60% of all seeds collected in the three treatment areas were *A. rubrum* and between 15% and 55% were *P. rubens*. Two species showed significant differences between treatment areas in the number of seeds collected: there was a significant difference between West Bear and A&Y for *B. alleghaniensis* (P-value 0.04) and between West Bear and East Bear for *F. grandifolia* (P-value 0.03).

In 1998–99, between 70% and 78% of all seeds collected were *B. alleghaniensis* and between 17% and 25% were *P. rubens* (Table 35). There was no significant difference between the three treatment areas in the number of seeds collected for *B. alleghaniensis* (P-0.4),

Table 35. Tree seed production indicator: number of tree seeds collected, by species, in both 1997–98 and 1998–99 and normalized tree seed data from the plots at Bear Brook Watershed in Maine.

	1997–98			1998–99		
Species	West Bear*	East Bear	A&Y	West Bear*	East Bear	A&Y
Number of seeds collected						
Acer pensylvanicum	13	6	42	81	59	65
Acer rubrum	32	75	146	29	37	41
Acer saccharum	1	0	0	134	60	76
Betula alleghaniensis	4	6	7	4582	6408	5199
Fagus grandifolia	4	11	0	59	106	46
Picea rubens	67	28	35	1576	1385	1821
Other species	0	0	0	75	135	153
Total	121	126	230	6536	8190	7401
Normalized tree seed data**						
Acer pensylvanicum	1	3	4	8	30	7
Acer rubrum	4	1	3	4	1	1
Acer saccharum	0.02	0	0	2	2	4
Betula alleghaniensis	0.1	0.1	0.2	143	128	149
Fagus grandifolia	0.03	0.1	0	0.4	1	0.5
Picea rubens	0.4	0.2	0.1	8	10	6
Other species	0	0	0	19	19	8

*Manipulated watershed.

**Number of seeds per number trees of the same species in the treatment area.

P. rubens (P-0.7), *A. pensylvanicum* (P-0.7) or *A. saccharum* (P-0.7). *Acer rubrum* was the only species that showed a decrease between the first and second years in the number of seeds collected in each of the three treatment areas.

Normalized data from the individual seed collection years of 1997–98 and 1998–99. To account for the uneven distribution of tree species in the three treatment areas and the resulting consequences for production of seed, seed production data were normalized (number of seeds collected per number of live trees of the same species in the area). In 1997–98, *A. rubrum* and *A. pensylvanicum* had the highest number of seeds per tree in all three treatment areas (Table 35). There were no significant differences among the treatment areas for normalized seeds per tree data for *A. rubrum* (P-value 0.6), *A. pensylvanicum* (P-value 0.2), or for all species combined (P-value 0.9). In 1998–99, *B. alleghaniensis* had the highest number of seeds per tree in all three treatment areas (Table 35). There were no statistically significant differences between treatment areas in normalized seeds per tree data for *B. alleghaniensis* (P-value 0.8) or for all species combined (P-value 0.7).

Two years of data averaged together. When the two years of seed collection data, 1997 through 1999, were averaged together the total number of seeds collected was lowest in West Bear (Table 36). However, there were no significant differences in total number of seeds collected between West Bear and East Bear and A&Y (P-value 0.5). In all three treatment areas *B. alleghaniensis* and *P. rubens* had the largest average number of seeds collected over the two years. In West Bear, 69% of all the seeds collected were *B. alleghaniensis* and 25% were *P. rubens*. In East Bear, *B. alleghaniensis* and *P. rubens* made up 77% and 17%, respectively, of all seeds collected. In A&Y *B. alleghaniensis* seeds and *P. rubens* seeds made up 68% and 24%, respectively.

Normalized data from two years of data averaged together. When the data were normalized (number of seeds collected per number of live trees of the same species in the area), the most common seed collected in all three treatment areas was *B. alleghaniensis* (Table 36). The next most common tree seed species varied by treatment area. *A. pensylvanicum* was the next most common seed species collected in East Bear and A&Y. In West Bear several species had similar normalized averages, these included *A. pensylvanicum*, *A.*

Table 36. Tree seed production indicator: average number of tree seeds collected, by species, for two years (1997–99) and normalized tree seed data from the plots at Bear Brook Watershed in Maine.

Species	West Bear*	East Bear	A&Y
Average number of seeds collected			
Acer pensylvanicum	47	32.5	53.5
Acer rubrum	30.5	56	93.5
Acer saccharum	67.5	30	38
Betula alleghaniensis	2293	3207	2603
Fagus grandifolia	31.5	58.5	23
Picea rubens	821.5	706.5	928
Other species	37.5	67.5	76.5
Total	3328.5	4158	3815.5
Normalized tree seed data**			
Acer pensylvanicum	5	16	5
Acer rubrum	4	1	2
Acer saccharum	1	1	2
Betula alleghaniensis	72	64	74
Fagus grandifolia	0.2	0.3	0.2
Picea rubens	4	5	3
Other species	9	10	4

*Manipulated watershed.
**Number of seeds per number trees of the same species in the treatment area.

rubrum, *P. rubens*, and some of the less common species including *A. balsamea* and *B. populifolia*.

Overstory Environment

Crown condition classification results

Trees: crown class and vigor. In the three treatment areas between 71% and 76% of all live trees were in the codominant crown class, 14% to 20% in the intermediate class, and 9% to 12% in the overtopped class (Table 37). There was only one tree, in A&Y, recorded in the dominant crown class. Using contingency table analysis there was a significant difference (P-value 0.04) between the three treatment areas in the crown class distribution. In West Bear the number of trees in the intermediate crown class was significantly higher (Cell Chi-Sq. 4.3) than the expected frequency. Although not statistically significant, West Bear was the only

Table 37. Crown condition classification indicator: number of trees by crown class (dominant, codominant, intermediate, and overtopped) and crown vigor (high, medium, or low) within the plots in the three treatment areas at Bear Brook Watershed in Maine in 1997.

	Dominant	Codominant			Intermediate			Overtopped		
	High	High	Med.	Low	High	Med.	Low	High	Med.	Low
All tree species combined										
West Bear*	0	271	45	3	72	16	3	30	9	1
East Bear	0	295	47	2	46	20	3	32	7	0
A&Y	1	333	42	6	42	27	1	35	23	1
***Acer pensylvanicum* trees/treatment area**										
West Bear*	0	2	3	0	2	1	0	1	1	0
East Bear	0	0	0	0	2	0	0	0	0	0
A&Y	0	2	2	1	0	5	0	0	0	0
***Acer rubrum* trees/treatment area**										
West Bear*	0	5	0	0	2	0	0	1	0	0
East Bear	0	41	12	0	3	2	0	2	0	0
A&Y	0	36	3	0	2	1	0	0	0	0
***Acer saccharum* trees/treatment area**										
West Bear*	0	54	5	0	5	0	0	0	1	0
East Bear	0	17	3	0	3	0	0	3	0	0
A&Y	0	20	0	0	0	0	0	0	0	0
***Betula alleghaniensis* trees/treatment area**										
West Bear*	0	21	2	0	9	0	0	0	0	0
East Bear	0	41	4	0	2	2	0	1	0	0
A&Y	0	26	1	0	5	0	0	2	1	0
***Fagus grandifolia* trees/treatment area**										
West Bear*	0	60	33	3	21	11	3	6	3	1
East Bear	0	104	20	2	19	14	3	8	4	0
A&Y	0	42	22	3	11	4	0	10	7	0
***Picea rubens* trees/treatment area**										
West Bear*	0	127	2	0	33	4	0	20	4	0
East Bear	0	90	5	0	15	2	0	18	3	0
A&Y	1	197	9	2	24	15	0	23	15	0

*Manipulated watershed.

treatment area with fewer trees than the expected frequency in both the codominant and overtopped crown classes.

For all trees combined there were no significant difference (P-value 0.8) between the three treatment areas in crown vigor. From 80% to 83% of live trees (all species combined) in the three treatment areas had high crown vigor, 16% to 18% had medium, and only 1% to 2% had low crown vigor (Table 37).

By individual species, in all three treatment areas between 63% and 100% of the *A. rubrum*, *A. saccharum*, *B. alleghaniensis*, *F. grandifolia*, and *P. rubens* trees were in the codominant crown class (Table 37). Between 0% and 25% of the trees for these major dominant species were in the intermediate crown class and between 0% and 17% were in the overtopped crown class. For *A. pensylvanicum* between 0% and 50% of the trees were in the codominant class, 30% and 100% in the intermediate, and 0% and 20% in the overtopped class. The two most common tree species at BBWM were *P. rubens* and *F. grandifolia*. For the former there was no significant difference (P-value 0.4) between the three treatment areas in the crown class distributions. However, for *F. grandifolia* (using contingency table analysis) there was a significant difference (P-value 0.02) between the three treatment areas. In A&Y the number of trees in the overtopped crown class was significantly higher (Cell Chi-Sq. 6.3) than the expected frequency.

Between 77% and 100% of the *A. rubrum*, *A. saccharum*, *B. alleghaniensis*, and *P. rubens* trees had high crown vigor (Table 37). The percentage of *F. grandifolia* and *A. pensylvanicum* with high crown vigor was lower, between 62% and 75% and 20% and 100%, respectively. These two species also had somewhat higher percentages of trees with moderate and low vigor than did the other major dominant tree species. For *F. grandifolia* this may be related to the severe cankering of bark tissue due to beech bark disease. There were no *A. rubrum*, *A. saccharum*, or *B. alleghaniensis* trees in the low crown vigor category.

There were no significant differences between the three treatment areas for crown vigor for *A. pensylvanicum* (P-value 0.2), *A. rubrum* (P-value 0.08), *A. saccharum* (P-value 0.3), *B. alleghaniensis* (P-value 0.5), or *F. grandifolia* (P-value 0.08). Based on contingency table analysis there was a significant difference for *P. rubens* (P-value 0.01); there were significantly more trees in the medium vigor class in A&Y than the expected frequency (Cell Chi Sq. 4.7). Although not statistically significant, A&Y also had a somewhat lower number of trees in the high vigor class than the expected frequency.

Trees: live crown ratio. The range of the live crown ratio (LCR) was 6% to 99% LCR in West Bear, from 5% to 85% LCR in East Bear, and 6% to 100% LCR in A&Y (Table 38). LCR means for the three treatment areas were 47.1% in West Bear, 47.6% in East Bear, and 46.5% in A&Y. The medians were 47.5% in West Bear, 50.0% in East Bear, and 45.0% in A&Y. LCR distributions in all three treatment areas were approximately normal distributions, with decreasing numbers of trees in both the high and low percentage categories.

When analyzed in 5% LCR classes, using contingency table analysis, there were significant differences between the treatment areas (P-value < 0.0001). However, only three cell Chi Squares out

Table 38. Crown condition classification indicator: frequency distribution of the number of trees within live crown ratio classes in the plots in the three treatment areas at Bear Brook Watershed in Maine in 1997.

Live Crown Ratio	West Bear*	East Bear	A&Y
0–5	0	1	0
6–10	3	1	3
11–15	4	5	8
16–20	23	6	8
21–25	17	25	31
26–30	29	38	44
31–35	44	38	51
36–40	57	37	70
41–45	48	66	63
46–50	46	63	69
51–55	71	61	54
56–60	48	48	41
61–65	23	28	29
66–70	15	15	15
71–75	11	7	10
79–80	6	11	4
81–85	3	1	2
89–90	0	0	2
91–95	1	0	1
96–99	1	0	2
100	0	0	4
Total # trees	450	451	511
Mean LCR	47.1	47.6	46.5
Median LCR	47.5	50.0	45.0

*Manipulated watershed.

of a total of 63 were significantly different from the expected frequency. East Bear had a significantly lower number of trees than the expected frequency in both the 40% (cell Chi Square 6.9) and 80% LCR classes (cell Chi Square 4.1). A&Y had a significantly higher number of trees than the expected frequency in the 100% LCR (cell Chi Sq. 6.8).

Saplings: crown class and vigor. In all the three treatment areas the majority of saplings, 69% to 94% (all species combined), were in the overtopped crown class (Table 39). From 1% to 14% of saplings were in the codominant crown class and 4% to 16% in the intermediate class. The majority of saplings had high crown vigor. From 70% to 84% of saplings (all species combined) in the three treatment areas had high crown vigor, 12% to 22% had medium, and only 1 to 8% had low crown vigor.

By individual species, *A. pensylvanicum*, *A. rubrum*, *A. saccharum*, and *B. alleghaniensis* each represented only about 4% to 5% of the total number of saplings recorded in the plots at BBWM. In general for these species most saplings were in the overtopped crown class, although each species had a few saplings in the codominant and intermediate crown classes (Table 39). *F. grandifolia* and *P. rubens* made up about 53% and 20%, respectively, of all saplings recorded. Some *F. grandifolia* and *P. rubens* saplings were recorded in the codominant and intermediate crown classes in some of the treatment areas; however, for both these species, from 82% to 100% of saplings were in the overtopped crown class.

Crown vigor for *A. saccharum* saplings was generally high (Table 39). For *A. rubrum*, *B. alleghaniensis*, and *F. grandifolia* saplings crown vigor was generally high to medium. For *A. pensylvanicum* saplings crown vigor was generally medium to low. Compared with the other species, crown vigor of *P. rubens* saplings was more variable: 43% to 70% had high crown vigor, 20% to 36% had medium, and 8% to 21% had low crown vigor.

Saplings: live crown ratio. The range of live crown ratio (LCR) was from 6% to 99% LCR in West Bear, from 11 to 100% LCR in East Bear, and 6% to 95% LCR in A&Y (Table 40). LCR means for the three treatment areas were 55.7% in West Bear, 61.2% in East Bear, and 56.0% in A&Y. Medians were 57.5% in West Bear, 65.0% in East Bear, and 55.0% in A&Y.

Tree seedlings: crown vigor. All tree seedlings recorded were in the overtopped crown class (Table 41). In all three treatment areas

Table 39. Crown condition classification indicator: number of saplings by crown class (codominant, intermediate, and overtopped) and crown vigor (high, medium, or low) within the plots in the three treatment areas at Bear Brook Watershed in Maine in 1997.

	Codominant			Intermediate			Overtopped		
	High	Med.	Low	High	Med.	Low	High	Med.	Low
Total number of saplings/treatment area									
West Bear*	1	2	0	4	0	0	40	12	5
East Bear	1	0	0	3	0	0	52	12	1
A&Y	5	2	0	7	1	0	29	3	2
***Acer pensylvanicum* saplings/treatment area**									
West Bear*	0	1	0	0	0	0	0	1	1
East Bear	0	0	0	0	0	0	0	1	0
A&Y	0	0	0	0	0	0	1	0	1
***Acer rubrum* saplings/treatment area**									
West Bear*	0	0	0	0	0	0	0	0	0
East Bear	0	0	0	1	0	0	1	1	0
A&Y	1	0	0	2	0	0	1	0	0
***Acer saccharum* saplings/treatment area**									
West Bear*	1	0	0	1	0	0	4	0	0
East Bear	1	0	0	0	0	0	1	0	0
A&Y	0	0	0	0	0	0	0	0	0
***Betula alleghaniensis* saplings/treatment area**									
West Bear*	0	0	0	0	0	0	3	1	0
East Bear	0	0	0	1	0	0	0	3	0
A&Y	0	0	0	1	0	0	0	0	0
***Fagus grandifolia* saplings/treatment area**									
West Bear*	0	1	0	3	0	0	27	5	1
East Bear	0	0	0	1	0	0	36	2	0
A&Y	0	0	0	4	0	0	17	1	0
***Picea rubens* saplings/treatment area**									
West Bear*	0	0	0	0	0	0	6	5	3
East Bear	0	0	0	0	0	0	7	2	1
A&Y	1	0	0	0	1	0	8	2	1

*Manipulated watershed.

between 91% and 93% of the seedlings (all species combined) had high crown vigor. From 5% to 8% of seedlings in the three treatment areas had medium vigor and 1% to 2% had low crown vigor.

By individual species, with only one exception, between 84% and 100% of the *A. pensylvanicum*, *A. rubrum*, *A. saccharum*, *B. alleghaniensis*, *F. grandifolia*, and *P. rubens* seedlings recorded had high crown vigor in all three treatment areas (Table 41). The one

Table 40. Crown condition classification indicator: frequency distribution of the number of saplings within live crown ratio classes in the plots in the three treatment areas at Bear Brook Watershed in Maine in 1997.

Live Crown Ratio	West Bear*	East Bear	A&Y
0–5	0	0	0
6–10	3	0	1
11–15	4	2	1
16–20	3	2	3
21–25	2	4	1
26–30	2	3	1
31–35	1	4	3
36–40	2	5	4
41–45	2	2	4
46–50	4	1	5
51–55	9	6	4
56–60	5	5	4
61–65	5	5	3
66–70	6	3	1
71–75	5	5	5
79–80	3	7	2
81–85	2	3	1
89–90	1	4	1
91–95	3	6	5
96–99	2	1	0
100	0	1	0
Total # saplings	64	69	49
Mean LCR	55.7	61.2	56.0
Median LCR	57.5	65.0	55.0

*Manipulated watershed.

exception was *P. rubens* seedlings in West Bear, where only 42% of the seedlings had high crown vigor. With the exception of *P. rubens* seedlings in West Bear, in all three treatment areas the major dominant species had less than 13% of seedlings with medium crown vigor and less than 7% with low crown vigor. For the *P. rubens* seedlings in West Bear, 23% had medium crown vigor and 35% had low crown vigor.

When analyzed by treatment area there were no statistically significant differences in seedling crown vigor among West Bear and East Bear and A&Y. When analyzed by different forest-types, in the deciduous forest-types there were no significant differences (P-value 0.08) among treatment areas in seedling crown vigor.

Table 41. Crown condition classification indicator: number of seedlings by crown class and crown vigor (high, medium, or low) within the plots in the three treatment areas at Bear Brook Watershed in Maine in 1997.

	Overtopped		
	High	Medium	Low
Total number of seedlings/treatment area			
West Bear*	578	28	15
East Bear	446	39	7
A&Y	389	32	9
***Acer pensylvanicum* seedlings/treatment area**			
West Bear*	183	6	2
East Bear	75	3	1
A&Y	104	6	0
***Acer rubrum* seedlings/treatment area**			
West Bear*	4	0	0
East Bear	28	3	0
A&Y	40	4	0
***Acer saccharum* seedlings/treatment area**			
West Bear*	239	5	1
East Bear	20	2	0
A&Y	48	2	0
***Betula alleghaniensis* seedlings/treatment area**			
West Bear*	66	4	0
East Bear	168	9	1
A&Y	51	5	4
***Fagus grandifolia* seedlings/treatment area**			
West Bear*	75	7	3
East Bear	98	15	1
A&Y	83	11	2
***Picea rubens* seedlings/treatment area**			
West Bear*	11	6	9
East Bear	16	1	2
A&Y	33	3	3

*Manipulated watershed.

However, in the coniferous forest-types there was a significant difference (P-value <0.0001) between treatment areas; in West Bear the number of seedlings in the low crown vigor class was significantly higher than the expected frequency (Cell Chi Sq. 14.8).

Tree canopy gap fraction results

For this research project, tree canopy gap fraction refers to canopy openness (percentage visible sky) or an estimate of the amount of diffuse light transmission to the understory. A LAI-2000 canopy analyzer was used to determine the amount of light reaching the forest understory. LAI-2000 measurements that determine canopy gap fraction are dimensionless. They can be expressed as percentages, with values that range from 0% (no sky visible to the sensor) to 100% (full sun visible to the sensor). As outlined in the methods section, the following analysis was done using both five and three rings (sky radiation at five and three zenith angles).

1996 results comparing West Bear to East Bear. In 1996, LAI-2000 measurements were collected for West Bear and East Bear only. For the two treatment areas overall, the percentage of visible sky (tree canopy gap fraction) was less in West Bear (3.7%) than in East Bear (5.6%) when analyzed using five rings (Table 42). It was similarly less in West Bear when analyzed using three rings. This means that half again as much light was reaching the forest floor in East Bear as in West Bear. The difference in percentage of visible sky between West Bear and East Bear in 1996 was not statistically significant with either five rings (P-value 0.5) or three rings (P-value 0.08). Although the results are not statistically significant, for understory vegetation in an already light-limiting environment of less than 6% visible light, relatively small differences in light levels may be an important factor in establishment and growth.

When stratified by forest types, the percentage of visible sky within the deciduous forest types in West Bear (3.6%) was less than within the deciduous forest types in East Bear (5.6%) with five rings (Table 42). Percentage of visible sky was also less in West Bear when analyzed using three rings. The difference in percent of visible sky between West Bear and East Bear in the deciduous forest-types was not statistically significant with either five rings (P-value 0.5) or three rings (P-value 0.6).

The difference between deciduous and coniferous forest types in light interception was evidenced in the results of stratifying the forest types in West Bear. (All the plots in East Bear were deciduous forest types.) The percentage of visible sky in the coniferous forest types (4.0%) in West Bear was greater than the percentage of visible sky in the deciduous forest types (3.6%) in West Bear using five rings (Table 42). Similarly, using three rings the percentage of visible sky in the coniferous forest types (4.5%) in West Bear was greater than in the deciduous forest types (3.4%). The differences

Table 42. Tree canopy gap fraction indicator: LAI-2000 data, 5 and 3 rings, for all the plots together and for the deciduous and coniferous forest types at Bear Brook Watershed in Maine in 1996.

Plot #	%Visible Sky	Plot #	%Visible Sky	Plot #	%Visible Sky	Plot #	%Visible Sky
All the plots: 5 rings				All the plots: 3 rings			
West Bear* 1	2.65	East Bear 1	1.25	West Bear* 1	1.95	East Bear 1	0.93
West Bear* 2	1.58	East Bear 2	0.90	West Bear* 2	1.23	East Bear 2	0.63
West Bear* 3	1.40	East Bear 3	1.05	West Bear* 3	1.00	East Bear 3	0.83
West Bear* 4	1.73	East Bear 4	2.53	West Bear* 4	1.13	East Bear 4	1.45
West Bear* 5	4.93	East Bear 5	10.23	West Bear* 5	5.08	East Bear 5	10.20
West Bear* 6	4.93	East Bear 6	6.88	West Bear* 6	5.53	East Bear 6	6.68
West Bear* 7	6.93	East Bear 7	7.95	West Bear* 7	7.40	East Bear 7	7.80
West Bear* 8	5.00	East Bear 8	10.05	West Bear* 8	5.70	East Bear 8	8.98
West Bear* 9	1.98	East Bear 9	6.13	West Bear* 9	2.33	East Bear 9	6.18
West Bear* 10	5.85	East Bear 10	9.43	West Bear* 10	5.70	East Bear 10	9.58
Mean	3.70		5.64	Mean	3.70		5.32
Median	2.65		6.50	Median	1.95		6.43
Deciduous forest-type plots only: 5 rings				Deciduous forest-type plots only: 3 rings			
West Bear* 1	2.65	East Bear 1	1.25	West Bear* 1	1.95	East Bear 1	0.93
West Bear* 2	1.58	East Bear 2	0.90	West Bear* 2	1.23	East Bear 2	0.63
West Bear* 3	1.40	East Bear 3	1.05	West Bear* 3	1.00	East Bear 3	0.83
West Bear* 4	1.73	East Bear 4	2.53	West Bear* 4	1.13	East Bear 4	1.45
West Bear* 5	4.93	East Bear 5	10.23	West Bear* 5	5.08	East Bear 5	10.20
West Bear* 7	6.93	East Bear 6	6.88	West Bear* 7	7.40	East Bear 6	6.68
West Bear* 10	5.85	East Bear 7	7.95	West Bear* 10	5.70	East Bear 7	7.80
		East Bear 8	10.05			East Bear 8	8.98
		East Bear 9	6.13			East Bear 9	6.18
		East Bear 10	9.43			East Bear 10	9.58
Mean	3.58		5.64	Mean	3.35		5.32
Median	2.65		6.50	Median	1.95		6.43
Coniferous forest-type plots only: 5 rings				Coniferous forest-type plots only: 3 rings			
West Bear* 6	4.93			West Bear* 6	5.53		
West Bear* 8	5.00			West Bear* 8	5.70		
West Bear* 9	1.98			West Bear* 9	2.33		
Mean	3.97			Mean	4.52		

*Manipulated watershed.

were not statistically significant for either five rings (P-value 0.8) or three rings (P-value 0.5).

1997 results comparing West Bear, East Bear and A&Y. In 1997, data were collected from eight plots in both West Bear and East Bear and ten plots in A&Y. (Data from plots 2 and 3 in West Bear

and plots 1 and 2 in East Bear were not captured.) For the three treatment areas overall, the percentage of visible sky was greater in West Bear (3.6%) than in either East Bear (3.2%) or A&Y (2.2%) when analyzed using five rings (Table 43). Percentage of visible sky was also greater in West Bear (3.3%) than East Bear (3.1%) or A&Y (1.3%) when analyzed using three rings. The difference among the three treatment areas in percentage of visible sky was not statistically significant with five rings (P-value 0.1). However, percentage of visible sky was significantly different between West Bear, East Bear, and A&Y using three rings (P-value 0.005). The percentage of visible sky was significantly less in A&Y than in West Bear or East Bear.

In the overall analysis West Bear had a higher percentage of visible sky than East Bear; however, by forest type this was not true within the deciduous forest types. In the deciduous forest-types, the percentage of visible sky in West Bear (3.1%) was lower than East Bear (3.2%), but higher than A&Y (1.5%) (Table 43). Percentage of visible sky was not significantly different among the three treatment areas using five rings (P-value 0.06). However, it was significantly different using three rings (P-value 0.04). A&Y (0.8%) had a significantly lower percent of visible sky than either West Bear (2.9%) or East Bear (3.1%). A similar pattern holds for the coniferous forest-types. The percent of visible sky in the coniferous forest types in West Bear (4.6%) was higher than A&Y (2.7%). (There were no coniferous forest-type cluster-plots in East Bear.) Again, there was no significant difference between West Bear and A&Y in percentage of visible sky using five rings (P-value 0.2), but there was a significant difference using three rings (P-value 0.003). A&Y (1.7%) had a significantly lower percentage of visible sky than West Bear (4.1%).

Differences between deciduous and coniferous forest types in percentage of visible sky can be compared in both West Bear and A&Y. (East Bear had no coniferous forest types recorded.) In West Bear the percentage of visible sky in the deciduous forest types (3.1%) was less than in the coniferous forest types (4.6%) using five rings (Table 43). Similarly, using three rings the percentage visible sky in West Bear in the deciduous forest types (2.9%) was less than in the coniferous forest types (4.1%). In West Bear the difference between the deciduous and conifer forest-types in percentage of visible sky was not statistically significant using either five rings (P-value 0.2) or three rings (P-value 0.2). In A&Y there was less visible sky in the deciduous forest-types using either five rings (1.5%) or three rings (0.8%) than the coniferous forest types using

Table 43. Tree canopy gap fraction indicator: LAI-2000 data, 5 and 3 rings, for all the plots together and for the deciduous and coniferous forest types at Bear Brook Watershed in Maine in 1997.

Plot #	%Visible Sky	Plot #	%Visible Sky	Plot #	%Visible Sky
All the plots: 5 rings					
West Bear* 1	2.28	East Bear 3	4.53	A 1	0.73
West Bear* 4	4.48	East Bear 4	3.35	A 2	3.08
West Bear* 5	1.70	East Bear 5	5.23	A 3	5.65
West Bear* 6	3.43	East Bear 6	2.30	A 4	2.50
West Bear* 7	4.00	East Bear 7	2.38	A 5	1.03
West Bear* 8	3.25	East Bear 8	2.65	Y 1	1.70
West Bear* 9	7.00	East Bear 9	3.70	Y 2	1.13
West Bear* 10	2.83	East Bear 10	1.55	Y 3	1.73
				Y 4	2.38
				Y 5	2.20
Mean	3.62		3.21		2.21
Median	3.34		3.00		1.96
All the plots: 3 rings					
West Bear* 1	2.35	East Bear 3	5.28	A 1	0.3
West Bear* 4	4.55	East Bear 4	3.75	A 2	2.13
West Bear* 5	1.03	East Bear 5	5.80	A 3	3.03
West Bear* 6	3.95	East Bear 6	1.93	A 4	2.08
West Bear* 7	4.20	East Bear 7	2.00	A 5	0.65
West Bear* 8	3.93	East Bear 8	2.45	Y 1	0.88
West Bear* 9	4.30	East Bear 9	2.50	Y 2	0.55
West Bear* 10	2.20	East Bear 10	1.25	Y 3	1.03
				Y 4	1.18
				Y 5	1.68
Mean	3.31		3.12		1.35
Median	3.94		2.48		1.10
Deciduous forest-type plots only: 5 rings					
West Bear* 1	2.28	East Bear 3	4.53	A 1	0.73
West Bear* 4	4.48	East Bear 4	3.35	A 5	1.03
West Bear* 5	1.70	East Bear 5	5.23	Y 1	1.70
West Bear* 7	4.00	East Bear 6	2.30	Y 4	2.38
West Bear* 10	2.83	East Bear 7	2.38		
		East Bear 8	2.65		
		East Bear 9	3.70		
		East Bear 10	1.55		
Mean	3.06		3.21		1.46
Median	2.83		3.00		1.36

Table 43. Continued.

Plot #	%Visible Sky	Plot #	%Visible Sky	Plot #	%Visible Sky
Deciduous forest-type plots only: 3 rings					
West Bear* 1	2.35	East Bear 3	5.28	A 1	0.30
West Bear* 4	4.55	East Bear 4	3.75	A 5	0.65
West Bear* 5	1.03	East Bear 5	5.80	Y 1	0.88
West Bear* 7	4.20	East Bear 6	1.93	Y 4	1.18
West Bear* 10	2.20	East Bear 7	2.00		
		East Bear 8	2.45		
		East Bear 9	2.50		
		East Bear 10	1.25		
Mean	2.87		3.12		0.75
Median	2.35		2.48		0.73
Coniferous forest-type plots only: 5 rings					
West Bear* 6	3.43			A 2	3.08
West Bear* 8	3.25			A 3	5.65
West Bear* 9	7.00			A 4	2.50
				Y 2	1.13
				Y 3	1.73
				Y 5	2.20
Mean	4.56				2.71
Median	3.43				2.35
Coniferous forest-type plots only: 3 rings					
West Bear* 6	3.95			A 2	2.13
West Bear* 8	3.93			A 3	3.03
West Bear* 9	4.3			A 4	2.08
				Y 2	0.55
				Y 3	1.03
				Y 5	1.68
Mean	4.06				1.75
Median	3.95				1.88

*Manipulated watershed.
Notes: Data was lost from two plots in West Bear and two plots in East Bear. Plots A-1 through A-5 and Y-1 through Y-5 are also referred to as A&Y-1 through A&Y-10, respectively.

either five rings (2.7%) or three rings (1.8%). The differences in percentage of visible sky between the deciduous forest types and coniferous forest-types in A&Y were not statistically significant with either five rings (P-value 0.1) or three rings (P-value 0.07).

1996 and 1997 results comparing each treatment area over these two years. To compare 1996 to 1997 in each treatment area, the same plots that were missing from West Bear and East Bear in 1997 were also dropped from the 1996 data set. This meant that in West Bear

plots 1 and 4 through 10 were used for the analyses and in East Bear plots 3 through 10 were used for the analyses. There was no significant difference between 1996 and 1997 in percent of visible sky recorded in West Bear using either five rings (P-value 0.5) or three rings (P-value 0.5). Similarly, no significant difference was found between 1996 and 1997 in percentage of visible sky recorded in East Bear for five rings (P-value 0.08) or three rings (P-value 0.2). (There was only one year of data for A&Y so it was not possible to compare two different years for this treatment area.)

Note: Since there was no significant difference between 1996 and 1997 for either West Bear or East Bear it was possible to "fill in" the missing 1997 plot data with 1996 plot data. (The missing plots were West Bear plots 2 and 3 and East Bear plots 1 and 2). When 1996 data was used to fill in the missing 1997 plots, the results of the analyses were similar to those reported previously in the section on 1997 results. However there were some differences in the statistically significant values as a result of additional data. In no case did the statistical significance change from significant to not significant. In one case the statistical significance did change from not significant to significant, that was in comparing the difference in percentage of visible sky between the deciduous and coniferous forest types within West Bear. When 1996 data were used to fill in the missing 1997 data, in West Bear there was a statistically significant difference (P-value 0.049) between the deciduous forest types (2.1%) and coniferous forest-types (4.6%) in the percentage of visible sky when using five rings.

CONCLUSIONS/IMPLICATIONS

While the results of this study indicated that the forested landscape at BBWM was heterogeneous in nature, overall there were few statistically significant differences in the composition or structure of the vegetation between the three treatment areas. There was a significantly higher number of *A. saccharum* seedlings in West Bear than in East Bear. Similarly, in the deciduous forest types, shrub abundance at the ground layer and low shrub layer were significantly higher in West Bear than in East Bear or A&Y. Whether these differences are related to enhanced levels of ammonium in the manipulation is speculative and would require further studies to demonstrate a possible relationship.

This study provided very comprehensive baseline information on forest vegetation at BBWM. The quantity and variety of data that were collected may potentially be applied to study various

ecological questions (e.g., nutrient cycling or species interactions) as well as the original question regarding the efficacy of forest health-monitoring indicators. Some components of the original research, in particular tree seed collection, are still ongoing and can provide continuous information on long-term status and trends of vegetation at BBWM. Other parts of the study have highlighted gaps in our understanding of mechanisms involved in the response of most plant species (especially understory species) to enhanced levels of nitrogen, reduced levels of calcium, enhanced levels of aluminum, and so on. Additionally, the original focus, to assess the efficacy of FHM indicators, has demonstrated the value of BBWM as a research location for testing potential indicators of the effects of atmospheric deposition.

LITERATURE CITED

Canadian Forest Service. 1999. *Forest Health in Canada: An overview 1998*. Natural Resources Canada, Canadian Forest Service, Forest Health Network, Atlantic Forestry Centre. 60p.

Eckhoff, J.D. 2000. Efficacy of forest health monitoring indicators to evince impacts in a chemically manipulated watershed. Ph.D. Thesis, University of Maine, Orono.

Esslinger, T.L., and R.S. Egan. 1995. A sixth checklist of the lichen-forming, lichenicolous, and allied fungi of the continental United States and Canada. Bryologist 98:467–549.

Eyre, F.H., ed. 1980. *Forest Cover Types of the United States and Canada*. Society of American Foresters, Washington, DC. 148p.

Fernandez, I, L. Rustad, M. David, K. Nadelhoffer, and M. Mitchell. 1999. Mineral soil and solution responses to experimental N and S enrichment at the Bear Brook Watershed in Maine (BBWM). *Environmental Monitoring & Assessment* 55:165–185.

Gleason, H.A., and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Canada*. The New York Botanical Garden, New York. 910p.

Hale, M.E. 1979. *How to Know the Lichens*. Wm. C. Brown Company Publishers, Dubuque, IA. 246p.

Hinds, J.W., P.L. Hinds, L.G. Biazrov, and J.D. Eckhoff. 1998. First United States record of the lichen Parmelia fertilis. *Northeastern Naturalist* 5:21–23.

Kahl, J.S., S.A. Norton, I.J. Fernandez, K.J. Nadelhoffer, C.T. Driscoll, and J.D. Aber. 1993. Experimental inducement of nitrogen saturation at the watershed scale. *Environmental Science & Technology* 27:565–568.

LI-COR. 1992. LAI-2000 plant canopy analyzer. Instruction Manual. LI-COR, Inc. Lincoln, NB.

Norton, S.A., J.S. Kahl, I.J. Fernandez, L.E. Rustad, J.P. Scofield, T.A. Haines. 1994a. Response of West Bear Brook Watershed, Maine, USA, to the addition of (NH4)2SO4: 3-year results. *Forest Ecology and Management* 68:61–73.

Norton, S.A., J.S. Kahl, J.P. Scofield, and I.J. Fernandez.1994b. Altered Soil-Soil Water Interactions at an Artificially Acidified Watershed at Bear Brook Watershed, Maine. Ecosystem Manipulation Experiments: Scientific Approaches, Experimental Design and Relevant Results. Ecosystems Research Report No. 20, ed. A. Jenkings, R.C. Ferrier and C. Kirby, 227–235.

Norton, S.A., R.F. Wright, J.S. Kahl, and J.P. Scofield. 1992. The MAGIC simulation of surface water acidification at, and first year results from, the Bear Brook Watershed Manipulation, Maine, USA. *Environmental Pollution* 77:279–286.

Rustad, L.E., I.J. Fernandez, M.B. David, M.J. Mitchell, K.J. Nadelhoffer, and R.B. Fuller. 1996. Experimental soil acidification and recovery at the Bear Brook Watershed in Maine. *Soil Science Soc. America J.* 60:1933–1943.

Rustad, L.E., J.S. Kahl, S.A. Norton, and I.J. Fernandez. 1994. Underestimation of dry deposition by throughfall in mixed northern hardwood forest. *J. Hydrology* 162:319–336.

Tallent-Halsell, N. G. (ed.). 1994. *Forest Health Monitoring 1994 Field Methods Guide.* EPA/620/R-94/027. United States Environmental Protection Agency, Washington, D.C.

Uddameri, V., S.A. Norton, J.S. Kahl, and J.P. Scofield 1995. Randomized intervention analysis of the response of the West Bear Brook Watershed, Maine to chemical manipulation. *Air, Water & Soil Pollution* 79:131–146.

USDA Forest Service. 1974. *Seeds of Woody Plants in the United States* (reprinted in 1989). USDA Forest Service, Division of Timber Management Research, Agriculture Handbook No. 450, Washington, DC. 883p.

Weber K.A., and G.B. Wiersma. 1997. Trace element concentration of mosses collected from a treated experimental forest watershed. *Toxicological & Environmental Chemistry* 65:17–29.

White, G., I. Fernandez, and G. Wiersma. 1999. Impacts of ammonium sulfate treatment on the foliar chemistry of forest trees at the Bear Brook Watershed in Maine. *Environmental Monitoring & Assessment* 55:235–250.

Witham, J.W., E.H. Moore, M.L. Hunter Jr., A.J. Kimball, and A.S. White. 1993. A Long-Term Study of an Oak Pine Forest Ecosystem: Techniques Manual for the Holt Research Forest. Maine Agricultural Experiment Station Technical Bulletin 153.

Table A-I. Locations of the vegetation plots relative to the grid markers at Bear Brook Watershed in Maine (plots established in 1996).

Plot number	Location from Point I	Grid point nearest to the plot center	Distance and direction to the nearest grid points	General condition of the plot
W-1-1		P-10	15 in west of P; 7.75 m north of 10	deciduous
W- 1-2	360°; 36.6m	P-12	15 m west of P; ≈51.67 m north of 10	deciduous
W-1-3	120°; 36.6m	Q-10	≈13.31 m west of Q; ≈10.5 m south of 10	deciduous
W-1-4	240°; 36.6m	0-10	≈16.69 m west of O; ≈10.5 m south of 10	deciduous
W-2-1		M-12	1.7 m east of M; 7.75 m north of 12	deciduous
W-2-2	360°; 36.6m	M-14	1.7 m east of M; ≈51.67 m north of 12	deciduous
W-2-3	120°; 36.6m	N-12	≈3.38 m east of N; 10.5 m south of 12	deciduous
W-2-4	240°; 36.6m	L-12	≈zero m east of L; 10.5 m south of 12	deciduous
W-3-1	(inverted)	K-13	15 m west of K; 7.75 m south of 13	deciduous
W-3-2	180°; 36.6m	K-11	15 m west of K; ≈51.67 m south of 13	deciduous
W-3-3	300°; 36.6m	J-13	≈16.69 m west of J; 10.5 m north of 13	deciduous
W-3-4	60°; 36.6m	L-13	≈13.31 m west of L; 10.5 m north of 13	deciduous
W-4-1		K-15	1.7 m east of K; 7.75 m north of 15	deciduous
W-4-2	360°; 36.6m	K-17	1.7 m east of K; ≈51.67 m north of 15	deciduous
W-4-3	120°; 36.6m	L-15	≈23.38 m east of L; ≈10.5 m south of 15	deciduous
W-4-4	240°; 36.6m	J-15	≈zero m east of J; ≈10.5 m south of 15	deciduous
W-5-1		G-16	0 m west of G; 7.75 m north of 16	deciduous
W-5-2	360°; 36.6m	G-18	0 m west of G; ≈51.67 m north of 16	deciduous
W-5-3	120°; 36.6m	H-16	≈1.69 m east of H; 10.5 m south of 16	deciduous
W-5-4	2400; 36.6m	F-16	≈1.69 m west of F; 10.5 m south of 16	deciduous
W-6-1	(inverted)	J-18	15 m west of J; 7.75 m south of 18	coniferous
W-6-2	180°; 36.6m	J-16	15 m west of J; ≈51.67 m south of 18	deciduous
W-6-3	300°; 36.6m	I-18	≈16.69 m west of I; ≈10.5 m north of 18	coniferous
W-6-4	60°; 36.6m	K-18	≈13.31 m west of K; ≈10.5 m north of 18	coniferous
W-7-1	(inverted)	E-1 8	4.64 m west of E; 7.75 m south of 18	deciduous
W-7-2	180°; 36.6m	E-16	4.64 m west of E; ≈51.67 m south of 18	deciduous
W-7-3	300°; 36.6m	D-18	≈17.95 m west of D; ≈10.5 m north of 18	deciduous
W-7-4	60°; 36.6m	F-18	≈2.95 m west of F; ≈10.5 m south of 18	deciduous
W-8-1		I-20	15 m west of I; 7.75 m north of 20	coniferous
W-8-2	360°; 36.6m	I-22	15 m west of I; ≈51.67 m north of 20	coniferous
W-8-3	120°; 36.6m	J-20	≈13.31 m west of J; ≈10.5 m south of 20	coniferous
W-8-4	2400; 36.6m	H-20	≈16.69 m west of H; ≈10.5 m south of 20	coniferous
W-9-1	(inverted)	F-22	1.7 m cast of F; 7.75 m south of 22	coniferous
W-9-2	180°; 36.6m	F-20	1.7 m east of F; ≈51.67 m south of 22	coniferous
W-9-3	300°; 36.6m	E-22	≈0 m east of E; 10.5 m north of 22	coniferous
W-9-4	60° 36.6m	G-22	≈3.38 m east of G; 10.5 m north of 22	coniferous
W-10-1		F-24	4 m east of F; 7.75 m north of 24	coniferous
W- 10-2	360°; 36.6m	F-26	4 m east of F; ≈51.67 m north of 24	deciduous
W-10-3	120°; 36.6m	G-24	≈3.38 m west of G; ≈10.5 m south of 24	deciduous
W-10-4	240°; 36.6m	E-24	≈0 m west of E; ≈10.5 m south of 24	deciduous

Table A- I Continued.

Plot number	Location from Point I	Grid point nearest to the plot center	Distance and direction to the nearest grid points	General condition of the plot
E-1-1	(askew)	P-15	1.7 m east of P; 26.25 m north of 14	deciduous
E-1-2	360°; 36.6m	P-16	1.7 m east of P; ≈70.17 m north of 14	deciduous
E-1-3	120°; 36.6m	Q-14	≈3.4 m east of Q; ≈7.95 m north of 14	deciduous
E-1-4	240°; 36.6m	O-14	≈0 m east of O; ≈7.95 m north of 14	deciduous
E-2-1	(inverted)	O -17	15 m west of 0; 7.75 m south of 17	deciduous
E-2-2	180°; 36.6m	O -15	15 m west of O; ≈51.67 m south of 17	deciduous
E-2-3	300°; 36.6m	N-17	≈16.69 m west of N; ≈10.5 m north of 17	deciduous
E-2-4	60°; 36.6m	P-17	≈13.31 m west of P; ≈10.5 m north of 17	deciduous
E-3-1		O -19	15 m west of 0; 7.75 m north of 19	deciduous
E-3-2	360°; 36.6m	O -21	15 m west of O; ≈51.67 m north of 19	coniferous
E-3-3	120°; 36.6m	P-19	≈13.31 m west of P; ≈10.5 m south of 19	deciduous
E-3-4	240°; 36.6m	N-19	≈16.69 m west of N; ≈10.5 m south of 19	deciduous
E-4-1	(inverted)	Q-20	10 m east of Q; 0 m north of 20	coniferous
E-4-2	180°; 36.6m	Q-18	10 m east of Q; ≈43.92 m south of 20	deciduous
E-4-3	3000; 36.6m	P-21	≈16.69 m west of Q; ≈10.5 m north of 21	deciduous
E-4-4	60°; 36.6m	S-21	≈13.31 m west of S; ≈10.5 m north of 21	coniferous
E-5-1	(inverted)	L-21	4.64 m west of L; 7.75 m south of 21	deciduous
E-5-2	180°; 36.6m	L-19	4.64 m west of L; ≈51.67 m south of 21	deciduous
E-5-3	300°; 36.6m	K-21	≈17.95 m west of K; ≈10.5 m north of 21	deciduous
E-5-4	60°; 36.6m	M-21	≈2.95 m west of M; ≈10.5 m north of 21	coniferous
E-6-1		P-23	15 m west of P; 7.75 m north of 23	deciduous
E-6-2	360°; 36.6m	P-25	15 m west of P; ≈51.67 m north of 23	coniferous
E-6-3	120°; 36.6m	Q-23	≈13.31 m west of Q; ≈10.5 m south of 23	coniferous
E-6-4	240°; 36.6m	O -23	≈16.69 m west of 0; ≈10.5 m south of 23	deciduous
E-7-1		L-23	4.64 m west of L; 7.75 m north of 23	deciduous
E-7-2	360°; 36.6m	L-25	4.64 m west of L; ≈51.67 m north of 23	deciduous
E-7-3	120°; 36.6m	M-23	≈2.95 m west of M; ≈10.5 m south of 23	deciduous
E-7-4	240°; 36.6m	K-23	≈17.95 m west of K; ≈10.5 m south of 23	coniferous
E-8-1	(inverted)	R-24	10 m east of R; 10 m north of 24	deciduous
E-8-2	180°; 36.6m	R-22	10 m east of R; ≈4 m north of 25	deciduous
E-8-3	300°; 36.6m	Q-25	≈8.5 m west of Q; ≈10.5 m north of 25	deciduous
E-8-4	60°; 36.6m	S-25	≈24.5 m west of S; ≈10.5 m north of 25	deciduous
E-9-1	(inverted)	N-26	15 m west of N; 7.75 m south of 26	deciduous
E-9-2	180°; 36.6m	N-24	15 m west of N; = 51.67 m south of 26	deciduous
E-9-3	300°; 36.6m	M-26	≈16.69 m west of M; ≈10.5 m north of 26	deciduous
E-9-4	60°; 36.6m	O -26	≈13.31 m west of O; 10.5 m north of 26	deciduous
E-10-1	(inverted)	J-25	15 m west of J; 7.75 m south of 25	deciduous
E- 10-2	180°; 36.6m	J-23	15 m west of J; ≈51.67 m south of 25	deciduous
E-10-3	300°; 36.6m	I-25	≈16.69 m west of I; ≈10.5 m north of 25	deciduous
E-10-4	60°; 36.6m	K-25	≈13.31 m west of K; ≈10.5 m north of 25	deciduous

Table A- I Continued.

Plot number	Location from Point I	Grid point nearest to the plot center	Distance and direction to the nearest grid points	General condition of the plot
A-1-1		V-13	45 m east of T; 7.75 m north of 13	deciduous
A-1-2	360°; 36.6m	V-15	45 m east of T; ≈51.67 m north of 13	deciduous
A-1-3	120°; 36.6m	W-13	≈13.31 m west of W; ≈10.5 m south of 13	deciduous
A-1-4	240°; 36.6m	U- 13	≈16.69 m west of U; ≈10.5 m south of 13	deciduous
A-2-1		U-17	75 m east of R; 7.75 m north of 17	coniferous
A-2-2	360°; 36.6m	U-19	75 m east of R; ≈51.67 m north of 17	coniferous
A-2-3	120°; 36.6m	V-17	≈13.31 west of V; ≈10.5 m south of 17	coniferous
A-2-4	240°; 36.6m	T-17	≈16.69 west of T; ≈10.5 m south of 17	deciduous
A-3-1		U-20	45 m east of S; 7.75 m north of 20	coniferous
A-3-2	360°; 36.6m	U-22	45 m east of S; ≈51.67 m north of 20	coniferous
A-3-3	120°; 36.6m	V-19	≈13.31 west of V; ≈10.5 m south of 20	coniferous
A-3-4	240°; 36.6m	T-19	≈16.69 west of T; ≈10.5 m south of 20	coniferous
A-4-1		V-24	15 m east of U; 2.75 m north of 24	coniferous
A-4-2	360°; 36.6m	V-26	15 m east of U; = 46.67 m north of 24	coniferous
A-4-3	120°; 36.6m	W-24	≈13.31 m west of W; ≈10.5 m south of 24	coniferous
A-4-4	240°; 36.6m	U-24	≈16.69 m west of U; ≈10.5 m south of 24	coniferous
A-5-1		Q-28	45 m east of Q; 37.75 m north of 27	deciduous
A-5-2	360°; 36.6m	R-31	45 m east of Q; ≈81.67 m north of 27	deciduous
A-5-3	120°; 36.6m	S-29	≈13.31 m west of S; ≈10.5 m south of 29	deciduous
A-5-4	240°; 36.6m	Q-29	≈16.69 m west of Q; ≈10.5 m south of 29	deciduous
Y-1-1		P-9	0 m west of P; 115 m south of 9	deciduous
Y-1-2	360°; 36.6m		0 m west of P; ≈71 m south of 9	deciduous
Y-1-3	120°; 36.6m			deciduous
Y-1-4	240°; 36.6m			deciduous
Y-2-1		L-10	0 m west of L; 115 m south of 10	coniferous
Y-2-2	360°; 36.6m		0 m west of L; ≈71 m south of 10	coniferous
Y-2-3	120°; 36.6m			deciduous
Y-2-4	240°; 36.6m			coniferous
Y-3-1		H-12	60 m west of H; 0 m south of 12	coniferous
Y-3-2	360°; 36.6m		0 m west of J; ≈15 m north of 13	deciduous
Y-3-3	120°; 36.6m			coniferous
Y-3-4	240°; 36.6m			coniferous
Y-4-1		C-12	0 m west of C; 0 m north of 12	coniferous
Y-4-2	360°; 36.6m	D-14	(easiest way in across 14 (near W-5-4)	deciduous
Y-4-3	120°; 36.6m		230° SW of 14 can see plot center downhill	deciduous
Y-4-4	240°; 36.6m			coniferous
Y-5-1		D-25	75 m west of D; 7.75 m north of 25	coniferous
Y-5-2	360°; 36.6m	A-27	75 m west of D; ≈51.67 m north of 25	coniferous
Y-5-3	120°; 36.6m	B-25	≈13.31 m west of B; ≈10.5 m south of 25	deciduous
Y-5-4	240°; 36.6m	*-25	≈16.69 m west of *; ≈10.5 m south of 25	coniferous

Table A-2. GPS locations of the vegetation plots at Bear Brook Watershed in Maine.

UNIVERSAL TRANSVERSE MECATOR; 19 NORTH; NAD 1927 (EASTERN US)

Location		North (m)	East (m)	Altitude (m)
W	1 1	4967568.387	570528.146	319.186
W	1 2	4967602.316	570529.861	326.256
W	1 3	4967550.629	570557.307	313.473
W	1 4	4967552.882	570496.069	323.658
W	2 1	4967625.779	570455.497	340.906
W	2 2	4967663.236	570454.010	343.455
W	2 3	4967608.776	570484.718	332.985
W	2 4	4967610.703	570422.021	345.819
W	3 1	4967642.462	570379.280	363.571
W	3 2	4967608.375	570377.430	354.424
W	3 3	4967657.340	570345.036	372.483
W	3 4	4967659.138	570408.590	250.743
W	4 1	4967711.537	570389.734	355.724
W	4 2	4967744.856	570392.044	367.057
W	4 3	4967693.996	570422.181	351.713
W	4 4	4967693.217	570359.402	364.136
W	5 1	4967747.621	570269.645	381.432
W	5 2	4967782.332	570270.083	386.151
W	5 3	4967730.128	570302.710	380.360
W	5 4	4967730.077	570238.574	394.393
W	6 1	4967792.779	570348.094	386.849
W	6 2	4967756.249	570345.502	373.361
W	6 3	4967804.849	570310.513	390.497
W	6 4	4967806.185	570376.910	385.990
W	7 1	4967791.941	570203.236	389.851
W	7 2	4967756.350	570203.947	401.272
W	7 3	4967806.893	570172.190	400.744
W	7 4	4967806.236	570237.620	399.711
W	8 1	4967867.056	570309.826	415.945
W	8 2	4967900.586	570314.038	429.404
W	8 3	4967840.816	570345.958	417.878
W	8 4	4967850.421	570278.936	403.484
W	9 1	4967910.550	570240.021	430.821
W	9 2	4967871.728	570238.759	421.221
W	9 3	4967928.655	570210.295	434.672
W	9 4	4967928.471	570271.476	438.497
W	10 1	4967985.038	570235.812	453.904
W	10 2	4967020.663	570235.695	457.029
W	10 3	4967965.611	570267.040	443.220
W	10 4	4967969.231	570202.515	442.734

Table A-2. Continued.

Location			UNIVERSAL TRANSVERSE MECATOR; 19 NORTH; NAD 1927 (EASTERN US) North (m)	East (m)	Altitude (m)
E	1	1	4967704.456	570538.000	343.642
E	1	2	4967742.528	570542.086	345.843
E	1	3	4967691.754	570575.001	332.208
E	1	4	4967686.041	570508.681	338.284
E	2	1	4967761.558	570497.039	354.616
E	2	2	4967724.718	570498.104	346.235
E	2	3	4967775.553	570465.531	363.841
E	2	4	4967779.358	570526.392	353.824
E	3	1	4967835.635	570496.440	373.688
E	3	2	4967870.567	570495.993	385.849
E	3	3	4967819.664	570524.044	361.279
E	3	4	4967820.653	570462.914	374.366
E	4	1	4967860.044	570581.404	365.575
E	4	2	4967824.009	570579.494	355.335
E	4	3	4967879.539	570550.938	363.600
E	4	4	4967876.099	570610.850	378.111
E	5	1	4967888.004	570413.083	404.721
E	5	2	4967850.906	570413.454	395.888
E	5	3	4967902.016	570383.599	418.210
E	5	4	4967904.002	570446.285	398.187
E	6	1	4967949.395	570524.177	380.027
E	6	2	4967988.696	570525.652	380.769
E	6	3	4967934.981	570558.228	382.115
E	6	4	4967937.138	570491.126	378.398
E	7	1	4967958.910	570416.300	420.247
E	7	2	4967995.201	570417.044	412.904
E	7	3	4967938.206	570442.818	401.773
E	7	4	4967940.302	570383.654	423.927
E	8	1	4967992.203	570614.303	397.281
E	8	2	4967954.530	570613.892	395.905
E	8	3	4968008.289	570583.658	396.031
E	8	4	4968008.432	570464.519	398.737
E	9	1	4968035.733	570464.745	409.754
E	9	2	4967997.226	570463.333	408.054
E	9	3	4968048.726	570435.357	422.682
E	9	4	4968052.621	570496.653	398.475
E	10	1	4968003.852	570342.447	443.585
E	10	2	4967966.706	570340.963	439.590
E	10	3	4968022.124	570311.554	451.902
E	10	4	4968022.019	570347.756	443.075

Table A-2. Continued.

Location	UNIVERSAL TRANSVERSE MECATOR; 19 NORTH; NAD 1927 (EASTERN US)		
	North (m)	East (m)	Altitude (m)
A 1 1	4967658.460	570706.165	301.777
A 1 2	4967690.341	570711.555	314.299
A 1 3	4967640.298	570736.372	296.473
A 1 4	4967641.217	570672.374	304.382
A 2 1	4967774.754	570666.543	347.987
A 2 2	4967801.496	570665.553	363.776
A 2 3	4967751.878	570697.282	349.143
A 2 4	4967752.431	570635.148	340.120
A 3 1	4967866.600	570673.236	396.614
A 3 2	4967902.584	570673.603	398.521
A 3 3	4967851.538	570705.226	387.491
A 3 4	4967849.718	570641.937	382.074
A 4 1	4967985.251	570705.498	411.139
A 4 2	4968021.318	570706.725	405.003
A 4 3	4967967.474	570735.970	415.211
A 4 4	4967969.185	570673.927	406.137
A 5 1	4968099.698	570617.328	390.732
A 5 2	4968137.967	570618.855	385.731
A 5 3	4968083.299	570647.222	388.898
A 5 4	4968083.966	570585.070	395.040
V 1 1	4967416.513	570536.023	309.362
Y 1 2	4967451.985	570534.539	300.873
Y 1 3	4967398.104	570565.270	294.730
Y 1 4	4967397.815	570504.914	313.472
Y 2 1	4967420.166	570411.159	327.084
Y 2 2	4967451.065	570418.121	338.547
Y 2 3	4967397.962	570444.492	325.870
Y 2 4	4967399.987	570381.582	330.337
Y 3 1	4967619.527	570241.285	388.893
Y 3 2	4967660.787	570244.774	402.209
Y 3 3	4967602.220	570272.022	376.115
Y 3 4	4967601.723	570209.703	387.588
V 4 1	4967622.110	570146.803	377.700
V 4 2	4967655.930	570147.122	383.531
Y 4 3	4967595.794	570175.748	383.333
Y 4 4	4967607.524	570116.769	361.866
Y 5 1	4968030.607	570105.309	441.772
Y 5 2	4968071.160	570111.330	451.041
Y 5 3	4968008.862	570136.615	443.312
Y 5 4	4968012.230	570074.307	433.410

Table A-3 Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	1	1	1	371	3.4	25	28.8	01	1	3	55	1	3	1	5	7	22	1	0	0	0	(1)
W	1	1	2	531	2.1	63	17.9	01	1	3	40	1	2	1	9	5	1	9	6	1	8	bbd
W	1	1	3	97	4.2	70	31.9	01	1	3	35	1	3	1	2	7	22	1	0	0	0	
W	1	1	4	531	2.6	202	15.8	01	1	3	45	1	2	1	9	5	1	9	6	1	8	bbd
W	1	1	5	531	6.1	235	16.7	01	1	3	65	1	2	1	9	5	1	9	6	1	7	bbd
W	1	1	6	531	6.1	253	19.0	01	1	3	30	2	2	1	9	5	1	9	6	1	7	bbd
W	1	1	7	315	2.7	332	16.0	01	1	5	30	2	2	2	0	7	22	6	0	0	0	(2)
W	1	2	1	531	5.7	32	17.1	01	5	4	55	1	2	1	9	5	1	9	6	1	9	bbd
W	1	2	2	531	6.1	45	26.2	01	5	3	20	2	2	1	9	5	1	9	6	1	6	bbd
W	1	2	3	531	3.0	64	29.5	01	5	3	55	1	2	1	9	5	1	9	6	1	4	bbd
W	1	2	4	316	6.2	72	34.5	01	5	3	60	1	0	0	0	0	0	0	0	0	0	
W	1	2	5	531	6.6	104	23.7	01	5	4	10	2	2	1	9	5	1	5	6	1	4	bbd
W	1	2	6	371	2.8	116	15.4	05	5													snag
W	1	2	7	12	3.5	150	35.7	01	5	3	40	1	0	0	0	0	0	0	0	0	0	
W	1	2	8	315	7.3	154	18.1	01	5	3	20	2	0	0	0	0	0	0	0	0	0	
W	1	2	9	531	4.7	263	13.4	01	5	4	45	1	2	1	9	5	1	9	6	1	8	bbd
W	1	2	10	531	4.6	288	18.1	01	5	3	40	1	2	1	9	5	1	9	6	1	7	bbd
W	1	2	11	531	5.4	314	18.4	01	5	3	20	2	2	1	9	5	1	9	6	1	3	bbd
W	1	2	12	531	5.2	314	14.3	01	5	3	15	2	2	1	9	5	1	9	6	1	4	bbd
W	1	2	13	97	7.3	317	25.5	01	5	3	45	1	0	0	0	0	0	0	0	0	0	
W	1	2	14	97	6.1	331	15.6	01	5	4	70	1	0	0	0	0	0	0	0	0	0	
W	1	3	1	371	5.2	360	19.1	01	1	3	40	1	2	31	0	0	0	0	0	0	0	(3)
W	1	3	2	371	5.2	360	16.8	01	1	3	30	2	2	31	0	0	0	0	0	0	0	(4)
W	1	3	3	371	5.2	360	15.8	01	1	3	55	1	2	31	0	0	0	0	0	0	0	(4)
W	1	3	4	371	5.9	52	17.0	01	1	3	30	2	2	31	0	0	0	0	0	0	0	(5)
W	1	3	5	371	5.2	68	16.4	01	1	3	55	1	0	0	0	0	0	0	0	0	0	
W	1	3	6	531	7.1	80	18.4	01	1	3	30	2	2	1	9	5	1	9	6	1	6	bbd
W	1	3	7	531	4.5	120	13.4	01	1	3	20	2	2	1	9	5	1	9	6	1	7	bbd
W	1	3	8	531	6.2	140	19.0	01	1	3	45	1	2	1	9	5	1	9	6	1	5	bbd
W	1	3	9	371	5.0	178	22.5	01	1	3	55	1	0	0	0	0	0	0	0	0	0	
W	1	3	10	531	3.8	188	15.6	01	1	3	20	2	2	1	9	5	1	9	6	1	5	bbd
W	1	3	11	371	5.6	222	28.7	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
W	1	3	12	531	5.0	240	14.0	01	1	3	15	3	2	1	9	5	1	9	6	1	7	bbd

(1) canker at dbh; (2) leaning, broken at base (it fell over the following winter); (3) measured low due to adjoining stems the tree is bonded to another sapling size stem; (4) clump trees #2 and3 are growing together, appear to be separate individuals; (5) base is butted against beech sapling

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	1	4	1	531	4.2	8	23.3	01	1	3	25	2	2	1	9	5	1	9	6	1	9	bbd
W	1	4	2	531	4.2	8	14.1	01	1	4	65	1	2	1	9	5	1	9	6	1	7	bbd
W	1	4	3	531	5.1	53	15.7	01	1	3	20	2	2	1	9	5	1	5	6	1	4	bbd
W	1	4	4	531	3.1	83	15.5	01	1	4	65	1	2	1	9	5	1	9	6	1	9	bbd
W	1	4	5	316	6.0	113	39.6	01	1	3	65	1	2	2	0	0	0	0	0	0	0	
W	1	4	6	318	1.5	184	58.5	01	1	3	60	1	2	2	0	0	0	0	0	0	0	(1)
W	1	4	7	531	7.3	184	21.9	01	1	3	25	2	2	1	8	5	1	7	6	1	4	bbd
W	1	4	8	531	5.2	221	14.6	01	1	4	70	1	2	1	9	5	1	9	6	1	7	bbd
W	1	4	9	531	6.2	280	12.7	01	1	4	55	1	2	1	8	5	1	3	6	1	5	bbd (new)
W	1	4	10	531	7.0	282	13.0	05	1													snag; bbd
W	1	4	11	531	6.7	342	18.1	01	1	3	60	1	2	1	9	5	1	9	6	1	7	bbd
W	2	1	1	371	3.3	121	31.4	01	3	3	50	1	2	2	0	0	0	0	0	0	0	fruiting body
W	2	1	2	318	5.8	122	60.8	01	3	3	35	1	2	2	0	0	0	0	0	0	0	(2)
W	2	1	3	318	3.7	158	41.1	01	3	3	45	1	2	2	0	0	0	0	0	0	0	(3)
W	2	1	4	531	7.3	314	26.3	01	3	3	40	1	2	1	9	5	1	9	6	1	8	bbd
W	2	1	5	318	5.1	339	49.7	01	3	3	55	1	2	2	0	0	0	0	0	0	0	(4)
W	2	2	1	318	4.6	106	71.5	01	3	3	50	1	2	2	0	0	0	0	0	0	0	(5)
W	2	2	2	531	3.3	192	13.5	05	3													snag; bbd
W	2	2	3	531	7.1	219	20.0	05	3													snag; bbd
W	2	2	4	531	3.4	254	47.4	01	3	3	60	1	2	1	4	5	1	6	6	1	8	bbd
W	2	3	1	97	7.0	8	33.5	01	1	3	50	1	0	0	0	0	0	0	0	0	0	
W	2	3	2	531	6.2	27	16.5	05	1													snag; bbd
W	2	3	3	531	3.9	32	22.8	01	1	3	60	1	2	1	9	5	1	9	6	1	7	bbd; (6)
W	2	3	4	531	6.4	74	21.9	01	1	3	30	2	2	1	9	5	1	7	6	1	3	bbd; (7)
W	2	3	5	531	5.7	107	13.5	01	1	4	20	2	2	1	9	5	1	9	6	1	2	bbd
W	2	3	6	97	6.7	138	14.0	01	1	3	20	2	0	0	0	0	0	0	0	0	0	
W	2	3	7	531	5.3	261	16.1	05	1													snag, bbd
W	2	3	8	531	5.9	288	18.3	01	1	4	20	2	2	1	9	5	1	7	6	1	7	bbd
W	2	3	9	531	4.4	325	16.0	01	1	3	60	1	2	1	9	5	1	9	6	1	8	bbd
W	2	3	10	531	6.6	338	18.5	01	1	3	40	1	2	1	9	5	1	8	6	1	5	bbd
W	2	3	11	NA	0.5	342	30.8	05	1													snag; (8)
W	2	4	1	531	5.3	4	13.4	05	1													snag; bbd
W	2	4	2	371	5.4	64	57.2	01	1	3	55	1	2	2	0	0	0	0	0	0	0	

(1) insect squiggles on the inner bark (only a little); burl on upper bole; (2) large wound with fruiting bodies; (3) large wound with fruiting bodies;
(4) large wound to ground; (5) small wound with punky wood; (6) woodpecker holes with decay; (7) lower bole 1/2 gone; (8) accidently not numbered

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	2	4	3	531	6.5	178	15.6	01	1	3	20	2	2	1	9	5	1	9	6	1	4	bbd
W	2	4	4	NA	4.6	202	14.3	05	1													snag; (1)
W	2	4	5	531	3.9	236	18.7	01	1	3	25	1	2	1	9	5	1	9	6	1	5	bbd
W	2	4	6	531	5.1	275	24.2	01	1	3	35	1	2	1	9	5	1	8	6	1	5	bbd; (2)
W	2	4	7	531	1.3	323	23.7	01	1	3	30	2	2	1	9	5	1	8	6	1	4	bbd
W	3	1	1	531	4.7	26	24.9	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
W	3	1	2	531	4.5	36	19.9	01	1	4	20	2	2	1	9	5	1	9	6	1	7	bbd; (3)
W	3	1	3	531	4.8	42	12.7	05	1													snag
W	3	1	4	531	6.3	54	13.0	01	1	3	25	2	2	1	9	5	1	9	6	1	6	bbd
W	3	1	5	531	4.2	84	13.3	01	1	3	30	2	2	1	9	5	1	9	6	1	7	bbd
W	3	1	6	531	4.8	118	14.9	01	1	3	20	2	2	1	9	5	1	9	6	1	5	bbd; (4)
W	3	1	7	371	0.8	158	19.5	05	1													snag
W	3	1	8	318	5.2	166	21.0	01	1	3	50	1	0	0	0	0	0	0	0	0	0	
W	3	1	9	97	3.0	210	22.3	01	1	3	45	1	0	0	0	0	0	0	0	0	0	(5)
W	3	1	10	318	6.2	218	18.0	01	1	3	40	1	0	0	0	0	0	0	0	0	0	(6)
W	3	1	11	97	7.1	244	12.8	05	1													snag
W	3	1	12	97	3.7	246	14.5	05	1													snag
W	3	1	13	531	5.8	256	12.8	01	1	4	45	1	2	1	8	5	1	5	6	1	5	bbd
W	3	1	14	315	3.6	264	14.0	01	1	3	30	2	0	0	0	0	0	0	0	0	0	
W	3	1	15	531	2.7	278	17.7	01	1	4	25	2	2	1	9	5	1	9	6	1	4	bbd
W	3	1	16	531	6.8	278	12.7	01	1	5	15	2	2	1	9	5	1	7	6	1	3	bbd
W	3	1	17	97	6.9	306	66.8	01	1	3	75	1	4	3	5	0	0	0	0	0	0	(7)
W	3	1	18	531	5.7	322	14.8	01	1	4	60	1	2	1	9	5	1	8	6	1	7	bbd
W	3	1	19	531	6.6	346	14.0	05	1													snag
W	3	2	1	531	4.0	66	22.4	01	1	3	55	1	2	1	9	5	1	6	6	1	4	bbd
W	3	2	2	531	6.7	82	15.5	01	1	3	35	1	5	1	3	0	0	0	0	0	0	healthy (8)
W	3	2	3	97	7.0	94	25.6	01	1	3	50	1	2	2	0	0	0	0	0	0	0	fruiting body
W	3	2	4	318	6.1	112	33.6	01	1	3	40	1	5	3	3	0	0	0	0	0	0	(9)
W	3	2	5	531	1.8	114	14.6	01	1	3	20	3	2	1	9	5	1	9	6	1	9	bbd
W	3	2	6	531	1.8	116	18.7	05	1													snag
W	3	2	7	531	5.8	136	13.7	01	1	3	20	2	2	1	9	5	1	7	6	1	4	bbd
W	3	2	8	531	1.7	138	15.7	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd

(1) missed at first so is number not painted on the tree; (2) dbh taken above tubing; (3) bole is broke in half at 6'-top leaning;
(4) growing into adjacent maple sapling, bottom 2'; (5) growing together w/ a beech sapling, lower 2'; (6) beech branch growing together ~8' up;
(7) very narrow, healing lightning scar; (8) beech - looks great!!!; (9) wound from broken branch

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	3	2	9	531	5.1	140	13.1	01	1	3	60	1	2	1	9	5	1	9	6	1	9	bbd
W	3	2	10	531	4.2	142	17.7	01	1	3	30	2	2	1	9	5	1	7	6	1	4	bbd
W	3	2	11	531	4.5	174	13.5	01	1	4	30	2	2	1	9	5	1	9	6	1	8	bbd
W	3	2	12	531	6.6	210	14.5	05	1													snag
W	3	2	13	531	5.2	218	18.2	05	1													snag
W	3	2	14	531	3.8	226	20.7	01	1	3	35	1	2	1	9	5	1	9	6	1	5	bbd
W	3	2	15	531	6.9	234	13.3	01	1	5	45	1	2	1	9	5	1	9	6	1	6	bbd
W	3	2	16	531	6.6	240	14.4	05	1													snag
W	3	2	17	531	7.1	244	22.6	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
W	3	2	18	531	3.7	288	16.8	01	1	3	25	2	2	1	9	5	1	9	6	1	7	bbd
W	3	2	19	531	3.4	308	14.3	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
W	3	2	20	531	2.6	312	17.6	05	1													snag
W	3	2	21	531	5.7	336	17.4	01	1	3	65	1	2	1	9	5	1	9	6	1	9	bbd
W	3	2	22	531	4.7	346	13.1	01	1	3	20	2	2	1	9	5	1	9	6	1	3	bbd
W	3	2	23	531	2.9	356	14.5	01	1	3	30	2	2	1	9	5	1	9	6	1	8	bbd
W	3	3	1	531	7.1	4	17.4	01	1	3	30	2	2	1	9	5	1	7	6	1	4	bbd
W	3	3	2	531	2.2	48	15.5	01	1	3	20	2	2	1	9	5	1	8	6	1	5	bbd
W	3	3	3	531	6.1	52	24.3	01	1	3	45	1	2	1	9	5	1	9	6	1	7	bbd; (1)
W	3	3	4	531	6.4	60	16.8	01	1	4	70	1	2	1	9	5	1	9	6	1	9	bbd
W	3	3	5	NA	5.2	88	36.8	05	1													snag
W	3	3	6	531	2.1	130	14.0	05	1													snag
W	3	3	7	531	1.1	194	19.4	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd; (2)
W	3	3	8	315	4.6	198	17.4	01	1	3	25	2	4	3	3	0	0	0	0	0	0	
W	3	3	9	531	7.1	200	19.0	01	1	3	45	2	2	1	9	5	1	9	6	1	9	bbd; (3)
W	3	3	10	531	6.0	228	35.4	01	1	3	45	1	2	1	8	5	1	8	6	1	7	bbd
W	3	3	11	531	6.7	246	25.5	01	1	3	55	1	2	1	9	5	1	9	6	1	5	bbd
W	3	3	12	531	4.6	330	15.3	01	1	3	20	2	2	1	9	5	1	8	6	1	5	bbd
W	3	3	13	531	4.8	336	12.9	01	1	3	25	2	2	1	9	5	1	8	6	1	6	bbd
W	3	4	1	97	1.0	14	33.4	01	1	3	40	1	2	31	0	0	0	0	0	0	0	(4)
W	3	4	2	531	6.1	36	13.4	05	1													snag; bbd
W	3	4	3	531	7.3	66	13.3	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
W	3	4	4	531	2.6	70	32.4	01	1	4	45	1	2	1	5	5	1	3	6	1	2	bbd
W	3	4	5	531	3.3	108	14.0	01	1	4	25	2	2	1	9	5	1	9	6	1	7	bbd
W	3	4	6	531	6.1	156	16.4	05	1													snag; bbd

(1) DBH measured above knot; (2) DBH measured above fork; (3) DBH measured above knots; (4) 3" wound with several large insect holes at 1 1/2' from ground level

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	3	4	7	531	1.9	184	17.1	05	1													snag; bbd
W	3	4	8	315	7.2	198	14.1	01	1	3	35	1	0	0	0	0	0	0	0	0	0	
W	3	4	9	531	1.3	200	20.8	01	1	4	20	3	2	1	9	5	1	9	6	1	9	bbd
W	3	4	10	315	6.8	200	15.2	05	1													snag
W	3	4	11	318	7.0	236	16.4	01	1	3	30	2	0	0	0	0	0	0	0	0	0	
W	3	4	12	97	2.1	294	42.4	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
W	3	4	13	97	7.1	294	15.2	01	1	5	20	2	0	0	0	0	0	0	0	0	0	
W	3	4	14	97	6.5	320	38.8	01	1	3	60	1	0	0	0	0	0	0	0	0	0	(1)
W	4	1	1	531	5.5	8	14.5	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd
W	4	1	2	531	6.1	28	19.8	01	1	4	35	1	2	1	9	5	1	9	6	1	9	bbd
W	4	1	3	531	7.3	128	24.6	01	1	3	25	2	2	1	9	5	1	9	6	1	8	bbd
W	4	1	4	531	6.2	136	26.4	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
W	4	1	5	531	5.9	204	28.7	01	1	3	60	1	2	1	9	5	1	9	6	1	5	bbd
W	4	1	6	531	1.7	240	45.6	01	1	3	65	1	2	1	9	5	1	9	6	1	9	bbd
W	4	1	7	531	5.5	256	14.7	01	1	5	20	3	2	1	9	5	1	9	6	1	9	bbd
W	4	1	8	318	5.7	278	63.8	01	1	3	60	1	2	2	0	0	0	0	0	0	0	(2)
W	4	1	9	531	6.7	298	33.5	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
W	4	2	1	531	6.6	44	14.0	01	1	3	80	1	2	1	9	5	1	9	6	1	9	bbd
W	4	2	2	531	5.0	68	16.0	01	1	3	30	2	2	1	9	5	1	9	6	1	8	bbd
W	4	2	3	531	6.4	90	15.1	01	1	4	55	1	2	1	9	5	1	9	6	1	9	bbd; (3)
W	4	2	4	531	1.9	98	15.0	01	1	4	35	1	2	1	9	5	1	9	6	1	4	bbd
W	4	2	5	531	3.1	130	17.3	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
W	4	2	6	531	3.9	180	31.7	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
W	4	2	7	531	6.6	182	13.4	05	1													snag
W	4	2	8	531	6.2	232	13.1	01	1	3	10	3	2	1	9	5	1	9	6	1	9	bbd; (4)
W	4	2	9	531	5.9	292	20.3	01	1	3	55	1	2	1	9	5	1	9	6	1	8	bbd
W	4	2	10	531	6.1	328	15.6	01	1	3	35	1	2	1	9	5	1	9	6	1	9	bbd; (5)
W	4	2	11	531	5.9	334	19.0	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd; (6)
W	4	2	12	371	2.4	342	55.7	01	1	3	50	1	3	1	4	0	0	0	0	0	0	big burl
W	4	3	1	531	2.8	26	19.8	01	1	3	30	2	2	1	9	5	1	9	6	1	7	bbd
W	4	3	2	531	1.8	46	16.1	01	1	4	55	1	2	1	9	5	1	9	6	1	8	bbd
W	4	3	3	315	6.2	54	13.1	01	1	4	30	2	0	0	0	0	0	0	0	0	0	
W	4	3	4	531	3.5	60	13.3	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd

(1) bundle of debris on uphill side interfering with dbh reading; (2) several fruiting bodies; (3) canopy narrow and spotty; (4) few lower epicormic branches; (5) tree #12 in the way of horizontal distance measurement for this tree; (6) tree#12 in the way of horizontal distance measurement for this tree

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	4	3	5	318	4.8	86	15.8	01	1	3	40	1	2	3	2	0	0	0	0	0	0	
W	4	3	6	531	2.2	124	13.2	01	1	4	85	1	2	1	9	5	1	9	6	1	9	bbd
W	4	3	7	531	4.2	152	17.7	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd
W	4	3	8	531	7.3	204	37.7	01	1	3	55	1	2	1	9	5	1	9	6	1	9	(1)
W	4	3	9	531	3.0	282	18.8	01	1	4	15	3	2	1	9	5	1	9	6	1	9	bbd
W	4	3	10	531	4.5	334	19.9	05	1													snag; (2)
W	4	3	11	97	7.2	348	18.5	01	1	3	35	1	2	3	3	0	0	0	0	0	0	open wound
W	4	3	12	531	5.6	348	19.1	05	1													snag; (3)
W	4	4	1	531	3.0	10	48.3	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd; (4)
W	4	4	2	531	7.1	136	19.0	05	1													snag; bbd
W	4	4	3	NA	6.3	160	39.8	05	1													snag
W	4	4	4	531	3.3	196	15.0	01	1	5	55	1	2	1	9	5	1	9	6	1	9	bbd; leaning
W	4	4	5	531	6.0	216	17.5	05	1													snag
W	4	4	6	NA	2.9	240	20.8	05	1													snag; bbd
W	4	4	7	531	6.8	316	18.7	05	1													snag; bbd
W	5	1	1	318	4.3	10	14.0	01	1	4	50	1	2	2	0	0	0	0	0	0	0	(5)
W	5	1	2	318	6.7	16	16.7	01	1	3	35	1	2	2	0	0	0	0	0	0	0	(6)
W	5	1	3	318	3.1	78	18.5	01	1	3	40	1	2	2	0	0	0	0	0	0	0	(7)
W	5	1	4	318	2.5	104	18.3	01	1	4	70	1	2	2	0	0	0	0	0	0	0	(8)
W	5	1	5	318	3.2	166	30.1	01	1	4	35	1	3	2	0	0	0	0	0	0	0	(9)
W	5	1	6	318	2.2	196	19.0	01	1	3	30	2	0	0	0	0	0	0	0	0	0	
W	5	1	7	318	5.5	256	13.3	01	1	3	35	1	2	2	0	0	0	0	0	0	0	(10)
W	5	1	8	318	4.4	296	22.0	01	1	3	40	1	2	2	0	0	0	0	0	0	0	(11)
W	5	1	9	531	5.8	296	12.9	01	1	4	55	1	2	1	9	5	1	9	6	1	8	bbd
W	5	1	10	318	1.2	324	17.0	01	1	3	45	1	2	2	0	5	3	2	0	0	0	(12)
W	5	1	11	318	6.9	334	16.0	01	1	3	35	1	0	0	0	0	0	0	0	0	0	
W	5	1	12	318	4.0	344	13.9	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
W	5	2	1	531	3.9	2	14.4	01	1	4	25	2	2	1	9	5	1	8	6	1	8	bbd
W	5	2	2	318	6.9	28	17.2	01	1	3	60	1	2	2	0	0	0	0	0	0	0	(13)
W	5	2	3	531	7.0	46	16.4	01	1	4	40	1	2	1	9	5	1	9	6	1	9	bbd
W	5	2	4	97	6.0	54	32.5	01	1	3	60	1	0	0	0	0	0	0	0	0	0	

(1) open wound, heart 1/2 rotted out; (2) BBD; 5 feet tall; (3) BBD; bole broke ~10' up, the rest of the tree is on the ground; (4) wound at bottom (30%);
(5) wound (20%) with punky wood; (6) wound (10%) with punk; (7) split at base with exposed heart rot, wound 30%; (8) 2 wounds at base with some decay (20%);
(9) leaning tree, 5' long wound with decay (30%); (10) hole going into center, wound 30%; (11) dbh taken above fork & split;
(12) wound with punk at bottom, open wound above; (13) small opening where ground and roots meet

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	5	2	5	531	4.9	60	13.1	05	1													snag; bbd
W	5	2	6	531	5.3	62	13.4	05	1													snag; bbd
W	5	2	7	531	4.2	112	15.0	01	1	3	35	1	2	1	9	5	1	9	6	1	9	bbd
W	5	2	8	97	7.1	120	27.1	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
W	5	2	9	318	4.2	158	23.5	01	1	3	40	1	2	2	0	0	0	0	0	0	0	(1)
W	5	2	10	531	5.8	192	23.2	01	1	3	35	1	2	1	9	5	1	9	6	1	8	bbd
W	5	2	11	318	5.9	208	17.8	01	1	3	45	1	2	3	2	0	0	0	0	0	0	(2)
W	5	2	12	531	5.5	214	14.0	01	1	3	40	1	2	1	9	5	1	9	6	1	7	bbd
W	5	2	13	531	2.1	218	14.3	05	1													snag
W	5	2	14	371	3.8	250	67.7	01	1	3	40	1	2	2	0	0	0	0	0	0	0	(3)
W	5	2	15	531	5.1	254	15.4	01	1	4	65	1	2	1	9	5	1	9	6	1	9	bbd
W	5	2	16	NA	0.8	332	14.8	05	1													snag
W	5	3	1	531	4.5	2	14.2	05	1													snag; bbd
W	5	3	2	531	2.2	52	14.3	01	1	4	10	3	2	1	9	5	1	9	6	1	9	bbd
W	5	3	3	318	3.6	54	14.9	01	1	4	60	1	3	2	0	5	2	0	6	2	0	(4)
W	5	3	4	531	6.3	86	18.8	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd
W	5	3	5	531	6.3	92	22.7	01	1	3	45	1	2	1	9	5	1	8	6	1	7	bbd
W	5	3	6	531	5.5	96	20.2	01	1	3	30	2	2	1	9	5	1	9	6	1	8	bbd
W	5	3	7	531	5.0	172	18.3	05	1													snag; (5)
W	5	3	8	318	3.0	230	23.7	01	1	3	55	1	2	2	0	0	0	0	0	0	0	(6)
W	5	3	9	97	6.3	240	18.3	01	1	3	35	1	0	0	0	0	0	0	0	0	0	
W	5	3	10	NA	7.3	292	16.0	05	1													snag; (7)
W	5	3	11	531	5.2	298	33.5	01	1	3	45	1	2	1	9	5	1	9	6	1	8	bbd
W	5	3	12	318	4.2	306	21.3	01	1	3	35	1	2	2	0	0	0	0	0	0	0	(8)
W	5	3	13	531	3.7	322	13.9	01	1	4	20	2	2	1	9	5	1	9	6	1	8	bbd
W	5	3	14	531	2.6	332	15.2	01	1	3	25	2	2	1	9	5	1	9	6	1	8	bbd
W	5	4	1	97	5.0	12	26.5	05	1													snag; (9)
W	5	4	2	97	6.6	14	29.2	01	1	3	55	1	0	0	0	0	0	0	0	0	0	
W	5	4	3	318	7.0	26	24.3	01	1	3	60	1	2	2	0	0	0	0	0	0	0	(10)
W	5	4	4	315	5.1	64	17.2	05	1													snag
W	5	4	5	NA	5.5	102	19.4	05	1													snag
W	5	4	6	318	2.0	148	19.1	01	1	3	55	1	3	2	0	0	0	0	0	0	0	(11)

(1) heart rot and insect holes; (2) old branch wound? no punky wood; (3) possible lightning scar that has decayed; (4) wound from rubbing beech tree #2; 3 wounds in upper layers (50,40,20%); (5) dbh measured above swelling; bbd; (6) picnidia, fruiting bodies in stump area; (7) dbh measured above swelling; (8) wound to ground (50%); (9) 3 leaders and the tallest is broken again; (10) 2 small deep wounds at base; (11) fruiting bodies in old branch wound; 1st 4 ft growing horizontally

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	5	4	7	531	6.0	160	15.1	01	1	4	35	1	2	1	9	5	1	9	6	1	8	bbd
W	5	4	8	531	7.3	160	19.2	01	1	3	40	1	2	1	9	5	1	9	6	1	5	bbd
W	5	4	9	531	1.5	206	21.9	01	1	3	55	1	2	1	9	5	1	9	6	1	8	bbd
W	5	4	10	318	5.5	226	13.6	01	1	3	30	2	2	2	0	0	0	0	0	0	0	(1)
W	5	4	11	318	6.2	310	19.9	01	1	3	50	1	0	0	0	0	0	0	0	0	0	(2)
W	5	4	12	318	1.1	330	13.4	01	1	3	75	1	0	0	0	0	0	0	0	0	0	
W	5	4	13	318	6.0	334	16.8	01	1	3	50	1	2	2	0	0	0	0	0	0	0	(3)
W	6	1	1	97	6.3	4	20.6	01	4	4	40	2	0	0	0	0	0	0	0	0	0	
W	6	1	2	97	4.6	10	36.3	01	4	3	55	1	0	0	0	0	0	0	0	0	0	(4)
W	6	1	3	97	3.2	16	24.3	01	4	5	60	1	0	0	0	0	0	0	0	0	0	(5)
W	6	1	4	97	3.3	80	16.7	01	4	3	75	1	0	0	0	0	0	0	0	0	0	(6)
W	6	1	5	97	3.7	80	45.0	01	4	5	60	1	0	0	0	0	0	0	0	0	0	(7)
W	6	1	6	97	3.6	140	18.9	01	4	5	55	1	0	0	0	0	0	0	0	0	0	
W	6	1	7	531	6.8	214	16.4	01	4	5	70	1	2	1	9	5	1	9	6	1	9	bbd
W	6	1	8	97	4.2	220	24.4	01	4	3	60	1	0	0	0	0	0	0	0	0	0	(8)
W	6	1	9	97	7.2	226	42.4	01	4	3	55	1	6	3	3	0	0	0	0	0	0	(9)
W	6	1	10	531	5.6	314	21.2	01	4	5	35	1	2	1	9	5	1	9	6	1	9	bbd; (10)
W	6	1	11	97	5.5	350	25.4	01	4	3	40	1	0	0	0	0	0	0	0	0	0	(11)
W	6	2	1	531	4.3	76	31.8	05	1													snag; bbd(12)
W	6	2	2	318	3.1	76	69.4	01	1	3	55	1	2	1	4	0	0	0	0	0	0	(13)
W	6	2	3	531	5.7	96	12.8	05	1													snag; bbd
W	6	2	4	97	5.3	104	19.8	01	1	5	40	1	0	0	0	0	0	0	0	0	0	(14)
W	6	2	5	315	6.4	172	15.1	01	1	5	45	1	0	0	0	0	0	0	0	0	0	(15)
W	6	2	6	531	6.7	182	20.9	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
W	6	2	7	531	1.6	254	22.9	01	1	5	40	1	2	1	9	5	1	9	6	1	9	bbd
W	6	2	8	97	6.6	296	23.7	01	1	3	75	1	0	0	0	0	0	0	0	0	0	
W	6	2	9	97	3.8	356	21.6	01	1	4	60	1	0	0	0	0	0	0	0	0	0	
W	6	3	1	371	0.8	38	54.8	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	6	3	2	531	5.7	78	14.1	05	2													snag; bbd
W	6	3	3	97	2.5	92	23.9	01	2	5	75	1	0	0	0	0	0	0	0	0	0	

(1) old branch wound with rot; (2) old branch wound near ground; (3) fruiting bodies, mushrooms; (4) absorbing dead spruce sapling at base;
(5) forked and buried between trees 2 & 4; (6) absorbing spruce tree #5, also a decaying stripe maple; (7) being absorbed at stump & absorbing a decaying stripe maple;
(8) forked ~15'up and one main leader; (9) had 3 forks ~25' up & 1 broke off this year, all 3 leaders had been alive;
(10) 2 main stems & 1 is dead; DBH taken above swelling & below fork; (11) old healed 4' long lightning scar; (12) tree #2 in way of horizontal distance;
(13) galls, 6 feet in size; (14) new leader around tree #2's branch; (15) healing crack 2' long

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	6	3	4	531	4.1	144	17.1	01	2	5	40	1	2	1	9	5	1	9	6	1	9	bbd; (1)
W	6	3	5	531	3.2	242	20.0	01	2	3	50	1	4	1	3	6	1	4	0	0	0	bbd; (2)
W	6	3	6	97	3.5	272	21.0	01	2	4	80	1	0	0	0	0	0	0	0	0	0	(3)
W	6	3	7	97	6.2	328	27.7	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	6	4	1	NA	4.5	2	13.5	05	4													snag
W	6	4	2	97	4.5	78	12.8	01	4	5	60	1	0	0	0	0	0	0	0	0	0	
W	6	4	3	97	4.9	106	15.0	01	4	5	50	1	0	0	0	0	0	0	0	0	0	
W	6	4	4	97	7.2	178	15.2	01	4	5	50	1	0	0	0	0	0	0	0	0	0	(4)
W	6	4	5	97	5.4	198	23.5	01	4	3	70	1	0	0	0	0	0	0	0	0	0	
W	6	4	6	97	6.1	240	33.0	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
W	6	4	7	97	3.5	244	51.5	01	4	3	65	1	3	2	0	0	0	0	0	0	0	(5)
W	6	4	8	316	1.4	274	22.0	01	4	5	60	1	0	0	0	0	0	0	0	0	0	
W	6	4	9	97	4.2	306	19.3	01	4	4	40	1	0	0	0	0	0	0	0	0	0	
W	6	4	10	97	6.6	316	28.5	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
W	6	4	11	97	4.6	334	35.6	01	4	3	65	1	0	0	0	0	0	0	0	0	0	(6)
W	7	1	1	318	3.2	6	21.4	01	1	3	35	1	2	2	0	0	0	0	0	0	0	(7)
W	7	1	2	318	4.3	22	20.1	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
W	7	1	3	531	2.4	52	16.1	01	1	3	50	1	2	1	9	5	1	9	6	1	6	bbd
W	7	1	4	531	4.8	70	15.0	05	1													snag; bbd (8)
W	7	1	5	318	5.0	76	15.1	01	1	3	35	1	3	2	0	5	3	7	0	0	0	(9)
W	7	1	6	318	6.3	76	18.0	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
W	7	1	7	318	6.6	102	15.3	01	1	3	50	1	3	3	2	0	0	0	0	0	0	(10)
W	7	1	8	318	0.4	144	22.4	01	1	3	45	1	2	2	0	0	0	0	0	0	0	(11)
W	7	1	9	318	5.5	212	18.1	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
W	7	1	10	318	1.7	220	18.1	01	1	3	45	1	3	2	0	0	0	0	0	0	0	(12)
W	7	1	11	318	6.8	226	23.0	01	1	3	55	1	3	2	0	0	0	0	0	0	0	(13)
W	7	1	12	318	5.2	266	13.2	01	1	3	35	1	0	0	0	0	0	0	0	0	0	
W	7	1	13	318	5.0	312	14.4	01	1	3	50	1	0	0	0	0	0	0	0	0	0	
W	7	1	14	318	6.7	320	13.8	01	1	3	30	2	0	0	0	0	0	0	0	0	0	
W	7	1	15	318	6.8	336	13.3	01	1	3	30	2	0	0	0	0	0	0	0	0	0	
W	7	2	1	318	6.3	24	19.5	01	1	3	55	1	0	0	0	0	0	0	0	0	0	(14)
W	7	2	2	318	6.3	24	16.5	01	1	3	50	1	0	0	0	0	0	0	0	0	0	(14)

(1) open wound; (2) bbd; good looking tree except healing branch wound 3' up; (3) forked, one main leader; (4) barely alive; 3' long healed lightning scar; (5) 2 deep holes (1x5" tall) with obvious rotted wood; (6) forked, 2 leaders; (7) fruiting bodies; (8) leaning on next maple; (9) old branch wound; wound from adjacent leaning beech snag; (10) insect cavities in wound; (11) wound goes to the ground, 20%; (12) 2 wounds with rot; (13) deep hole withpunky wood; (14) shared stump

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	7	2	3	318	7.1	26	16.6	01	1	3	50	1	2	2	0	0	0	0	0	0	0	(1)
W	7	2	4	315	5.1	86	12.8	01	1	4	50	1	2	2	0	0	0	0	0	0	0	(2)
W	7	2	5	318	4.7	88	13.6	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
W	7	2	6	318	1.9	118	15.4	01	1	3	35	1	5	3	9	0	0	0	0	0	0	(3)
W	7	2	7	97	5.5	128	20.8	01	1	4	60	1	0	0	0	0	0	0	0	0	0	(4)
W	7	2	8	97	4.5	156	15.1	01	1	4	45	1	0	0	0	0	0	0	0	0	0	(5)
W	7	2	9	318	6.5	204	17.5	01	1	5	20	2	2	2	0	6	21	7	0	0	0	(6)
W	7	2	10	318	5.1	204	16.7	01	1	3	60	1	0	0	0	0	0	0	0	0	0	(7)
W	7	2	11	531	7.1	216	19.3	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
W	7	2	12	318	4.2	250	17.2	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
W	7	2	13	531	3.5	258	23.6	01	1	3	35	1	2	1	9	5	1	9	6	1	9	bbd; (8)
W	7	2	14	315	6.6	284	13.0	05	1													snag
W	7	2	15	318	5.7	296	16.3	01	1	3	50	1	2	2	0	0	0	0	0	0	0	(9)
W	7	2	16	318	4.4	314	19.5	01	1	3	55	1	2	2	0	0	0	0	0	0	0	(10)
W	7	3	1	318	2.7	40	17.7	01	1	3	40	1	3	2	0	0	0	0	0	0	0	(11)
W	7	3	2	318	5.8	53	13.2	01	1	3	55	1	3	2	0	0	0	0	0	0	0	(12)
W	7	3	3	97	5.6	144	33.1	01	1	3	65	1	0	0	0	0	0	0	0	0	0	forked
W	7	3	4	97	4.6	166	37.4	01	1	3	85	1	0	0	0	0	0	0	0	0	0	
W	7	3	5	97	3.2	185	27.5	01	1	3	55	1	2	3	2	0	0	0	0	0	0	(13)
W	7	3	6	316	5.2	216	24.6	01	1	3	55	1	0	0	0	0	0	0	0	0	0	
W	7	3	7	318	6.1	242	13.0	01	1	4	50	1	0	0	0	0	0	0	0	0	0	
W	7	3	8	318	5.9	268	13.1	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
W	7	3	9	315	5.8	284	16.9	05	1													snag; (14)
W	7	3	10	97	3.1	290	38.7	01	1	3	50	1	0	0	0	0	0	0	0	0	0	(15)
W	7	3	11	318	6.6	339	13.9	01	1	3	60	1	3	2	0	0	0	0	0	0	0	fungus goop
W	7	4	1	531	4.7	47	13.5	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
W	7	4	2	531	1.6	65	13.2	01	1	5	25	2	2	1	9	5	1	9	6	1	9	bbd
W	7	4	3	531	3.0	88	15.4	01	1	4	20	2	2	1	9	5	1	8	6	1	7	bbd
W	7	4	4	531	5.4	110	18.2	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
W	7	4	5	531	3.5	127	13.2	01	1	4	55	1	2	1	9	5	1	8	6	1	8	bbd
W	7	4	6	97	6.4	137	26.8	01	1	3	35	1	0	0	0	0	0	0	0	0	0	

(1) open wound with rot to the ground (20%); (2) open wound to ground (30%); (3) crack travelling up and around bole; (4) forked 8' up; (5) forked 15' up; (6) broken top 25' up; (7) 3' growing horizontal at first; (8) lower 10' half rotted away well into the heart wood; (9) fruiting bodies & mushrooms & open wound 30%; (10) wound with punk (10%); (11) old branch wound, hole with punky wood; (12) old branch hole with punk; (13) 2 separate wounds, one 20% and one from old branch 20%; (14) fell down in the fall of '97; (15) 3 small wounds on bottom but too small

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	7	4	7	97	7.2	142	39.4	01	1	3	60	1	2	2	0	0	0	0	0	0	0	(1)
W	7	4	8	97	5.6	153	23.9	01	1	3	45	1	0	0	0	0	0	0	0	0	0	forked 25' up
W	7	4	9	531	1.4	164	16.5	01	1	4	30	2	2	1	9	5	1	9	6	1	9	bbd
W	7	4	10	315	4.3	165	12.9	05	1													snag
W	7	4	11	97	5.8	217	13.0	05	1													snag
W	7	4	12	97	5.8	217	13.8	05	1													snag
W	7	4	13	531	2.0	229	14.4	01	1	3	35	1	2	1	9	5	1	9	6	1	9	bbd
W	7	4	14	531	6.6	234	21.2	05	1													snag, bbd
W	7	4	15	318	3.5	267	14.6	01	1	3	35	1	0	0	0	0	0	0	0	0	0	
W	7	4	16	318	5.9	268	49.5	01	1	3	35	1	2	2	0	0	0	0	0	0	0	(2)
W	7	4	17	531	6.6	289	17.7	05	1													snag; bbd
W	7	4	18	531	3.5	300	17.0	01	1	3	45	1	2	1	9	5	1	7	6	1	5	bbd
W	7	4	19	531	5.8	321	19.4	01	1	3	40	1	2	1	9	5	1	9	6	1	8	bbd
W	7	4	20	531	2.7	330	17.4	01	1	5	25	2	2	1	9	5	1	9	6	1	9	bbd
W	7	4	21	531	2.9	338	14.7	01	1	4	50	1	2	1	9	5	1	9	6	1	6	bbd
W	7	4	22	531	3.4	350	13.0	01	1	3	30	2	2	1	9	5	1	9	6	1	5	bbd
W	8	1	1	97	5.7	2	20.9	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
W	8	1	2	97	6.1	18	13.2	01	4	4	50	1	0	0	0	0	0	0	0	0	0	flaky bark
W	8	1	3	97	5.9	52	31.0	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
W	8	1	4	97	6.6	96	38.2	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
W	8	1	5	97	2.9	104	16.4	01	4	3	40	1	0	0	0	0	0	0	0	0	0	
W	8	1	6	97	3.8	122	20.9	01	4	3	60	1	0	0	0	0	0	0	0	0	0	forked
W	8	1	7	97	5.5	144	16.9	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
W	8	1	8	97	4.0	170	15.0	01	4	4	25	2	6	21	2	0	0	0	0	0	0	(3)
W	8	1	9	97	6.8	192	33.0	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
W	8	1	10	97	7.3	204	34.3	01	4	3	45	1	1	2	0	0	0	0	0	0	0	(4)
W	8	1	11	97	1.1	224	28.4	01	4	3	50	1	2	2	0	0	0	0	0	0	0	(5)
W	8	1	12	97	3.0	244	46.5	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
W	8	1	13	97	6.0	252	15.5	05	4													snag
W	8	1	14	97	5.6	286	29.8	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
W	8	1	15	97	5.3	326	28.8	05	4													snag
W	8	1	16	97	5.2	332	17.1	01	4	4	60	1	0	0	0	0	0	0	0	0	0	
W	8	1	17	97	7.1	340	14.7	05	4													snag

(1) 3 separate deep holes (~4" deep) & a wound; lost original leader; (2) deep hole (~6") into tree center, egg inside?; (3) spire still on top but dead;
(4) root (5" in diameter)w/ wound 30% & decay; (5) narrow long wound under bark w/ fungus; healing wound, old fork broke off

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	8	2	1	97	2.4	20	29.3	01	2	3	65	1	0	0	0	0	0	0	0	0	0	(1)
W	8	2	2	97	4.9	20	33.3	01	2	3	65	1	0	0	0	0	0	0	0	0	0	(2)
W	8	2	3	97	4.7	78	21.0	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	8	2	4	97	7.0	90	31.8	01	2	3	50	1	0	0	0	0	0	0	0	0	0	(3)
W	8	2	5	97	5.7	108	20.8	01	2	3	55	1	4	2	0	0	0	0	0	0	0	(4)
W	8	2	6	97	3.9	144	26.9	01	2	3	55	1	0	0	0	0	0	0	0	0	0	(5)
W	8	2	7	97	6.1	166	25.0	01	2	3	50	1	0	0	0	0	0	0	0	0	0	(6)
W	8	2	8	97	5.8	190	14.3	01	2	4	35	1	0	0	0	0	0	0	0	0	0	
W	8	2	9	97	3.4	192	17.1	01	2	4	50	1	0	0	0	0	0	0	0	0	0	
W	8	2	10	97	2.6	200	22.5	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
W	8	2	11	97	3.1	234	17.0	01	2	4	45	1	0	0	0	0	0	0	0	0	0	
W	8	2	12	97	4.6	238	16.1	01	2	4	45	1	0	0	0	0	0	0	0	0	0	(7)
W	8	2	13	97	6.1	258	24.8	01	2	3	55	1	3	2	0	0	0	0	0	0	0	(8)
W	8	2	14	97	6.2	260	18.0	01	2	3	40	1	0	0	0	0	0	0	0	0	0	(9)
W	8	2	15	97	3.0	264	21.6	01	2	3	35	1	0	0	0	0	0	0	0	0	0	(10)
W	8	2	16	97	3.7	270	25.0	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
W	8	2	17	97	2.2	274	17.3	01	2	3	45	1	0	0	0	0	0	0	0	0	0	(11)
W	8	2	18	97	7.2	288	31.7	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	8	2	19	NA	5.0	332	42.5	05	2													snag
W	8	2	20	NA	4.6	352	13.9	05	2													snag
W	8	3	1	NA	2.3	4	15.0	05	2													snag
W	8	3	2	97	5.4	18	16.9	01	2	4	65	1	0	0	0	0	0	0	0	0	0	
W	8	3	3	97	6.8	42	18.7	01	2	4	80	1	0	0	0	0	0	0	0	0	0	
W	8	3	4	97	5.0	98	36.6	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	8	3	5	97	4.0	126	17.4	01	2	4	60	1	0	0	0	0	0	0	0	0	0	
W	8	3	6	97	6.7	126	14.9	01	2	5	40	1	0	0	0	0	0	0	0	0	0	
W	8	3	7	97	2.2	146	20.7	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
W	8	3	8	97	3.4	204	16.1	01	2	4	45	1	0	0	0	0	0	0	0	0	0	
W	8	3	9	97	6.4	230	22.7	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	8	3	10	97	3.5	244	15.9	01	2	5	40	1	0	0	0	0	0	0	0	0	0	
W	8	3	11	97	1.9	248	13.2	01	2	5	30	2	0	0	0	0	0	0	0	0	0	(12)

(1) old branch wound in stump, appears to be healing; forked 18' up, one leader; (2) forked ~25'up-2 leaders alive; (3) forked 20' up w/ 5 leaders, only 1 main, though;
(4) old fork wound (1 broke off) & splitting for 10' all together; (5) forked 20' up w/ 2 leaders; healing wound; (6) forked 20' up, but only 1 leader;
(7) forked ~20' & 30', 1 leader now; (8) open wound 30% with decay and resin; (9) bent from old fork at 25', one leader; (10) forked 20' up, one leader only;
(11) open wound healing over, less than 20%; (12) broken top, new leader (under tree # 14)

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	8	3	12	97	3.9	260	12.7	01	2	4	40	1	0	0	0	0	0	0	0	0	0	
W	8	3	13	97	6.4	282	36.6	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
W	8	3	14	97	1.8	300	37.3	01	2	3	60	1	0	0	0	0	0	0	0	0	0	(1)
W	8	3	15	371	6.3	316	32.8	01	2	3	50	1	1	2	0	3	2	0	0	0	0	(2)
W	8	3	16	97	5.0	322	21.9	01	2	3	55	1	0	0	0	0	0	0	0	0	0	(3)
W	8	4	1	97	2.9	2	30.9	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
W	8	4	2	97	6.7	24	19.3	01	2	3	30	2	0	0	0	0	0	0	0	0	0	
W	8	4	3	97	7.1	38	21.5	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
W	8	4	4	97	4.9	46	30.8	01	2	3	40	1	3	4	8	0	0	0	0	0	0	
W	8	4	5	97	2.5	54	27.5	01	2	3	40	1	0	0	0	0	0	0	0	0	0	(4)
W	8	4	6	97	4.2	80	15.6	01	2	4	25	2	0	0	0	0	0	0	0	0	0	
W	8	4	7	97	6.8	82	13.8	01	2	4	25	2	0	0	0	0	0	0	0	0	0	
W	8	4	8	97	5.9	98	26.3	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
W	8	4	9	97	5.5	130	23.0	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
W	8	4	10	97	2.6	134	30.8	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
W	8	4	11	97	4.8	142	14.8	01	2	4	55	1	6	21	1	0	0	0	0	0	0	(5)
W	8	4	12	97	7.0	166	25.9	01	2	3	50	1	0	0	0	0	0	0	0	0	0	(6)
W	8	4	13	316	3.8	176	21.2	01	2	3	35	1	2	2	0	0	0	0	0	0	0	(7)
W	8	4	14	97	3.1	194	14.2	01	2	5	35	1	6	21	1	0	0	0	0	0	0	lost leader
W	8	4	15	97	4.3	214	14.5	01	2	5	40	1	0	0	0	0	0	0	0	0	0	
W	8	4	16	97	3.9	234	22.6	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
W	8	4	17	97	5.7	246	35.7	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
W	8	4	18	97	5.5	302	17.5	01	2	4	35	1	0	0	0	0	0	0	0	0	0	
W	8	4	19	97	6.5	304	14.2	05	2													snag; (8)
W	8	4	20	97	6.1	322	20.7	05	2													snag
W	8	4	21	97	7.3	322	17.2	01	2	3	35	1	0	0	0	0	0	0	0	0	0	
W	8	4	22	97	2.8	322	29.0	01	2	3	55	1	0	0	0	0	0	0	0	0	0	(9)
W	9	1	1	97	2.2	2	18.6	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	9	1	2	97	3.7	16	16.8	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	9	1	3	97	4.7	24	14.8	01	2	3	35	1	0	0	0	0	0	0	0	0	0	
W	9	1	4	97	5.0	28	14.0	01	2	4	50	1	4	2	0	0	0	0	0	0	0	(10)

(1) curvy at 25-30'up, looks good; (2) cavity in center decayed down below & wound 30% at base; decay on old branch wounds; (3) curvy at 10', but looks ok;
(4) forked 25' up-2 leaders; (5) spire is dead at top (dead leader); (6) forked at 10' w/ 2 leaders, 1 leader dominant, the other shorter; new leader at top too;
(7) several narrow wounds with decay along lower bole; (8) snag; leaning on tree #23; (9) 20" long wound, looks deep but filled with resin & bark now (10' up);
(10) small wound with rotten wood 8' up

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	9	1	5	97	6.8	40	18.5	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
W	9	1	6	97	5.9	52	16.1	01	2	5	40	1	0	0	0	0	0	0	0	0	0	(1)
W	9	1	7	97	7.3	78	19.0	01	2	3	70	1	0	0	0	0	0	0	0	0	0	
W	9	1	8	97	7.2	102	17.2	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
W	9	1	9	97	3.2	112	24.0	01	2	3	70	1	0	0	0	0	0	0	0	0	0	
W	9	1	10	97	1.8	128	21.6	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	9	1	11	97	5.7	130	17.6	01	2	3	70	1	0	0	0	0	0	0	0	0	0	
W	9	1	12	97	0.7	138	24.8	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
W	9	1	13	97	3.3	146	15.4	01	2	5	40	1	0	0	0	0	0	0	0	0	0	
W	9	1	14	97	4.1	164	15.3	01	2	5	35	1	1	2	0	0	0	0	0	0	0	(2)
W	9	1	15	97	7.0	210	47.4	05	2													snag; (3)
W	9	1	16	97	7.3	236	44.5	01	2	3	60	1	2	2	0	5	2	0	0	0	0	(4)
W	9	1	17	97	5.8	260	24.3	01	2	3	65	1	0	0	0	0	0	0	0	0	0	(5)
W	9	1	18	97	3.7	272	17.0	01	2	3	55	1	5	2	0	0	0	0	0	0	0	(6)
W	9	1	19	97	4.9	298	23.8	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
W	9	1	20	97	6.8	342	32.9	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	9	1	21	97	3.9	346	24.0	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
W	9	1	22	97	6.9	358	16.5	01	2	3	50	1	0	0	0	0	0	0	0	0	0	(7)
W	9	2	1	97	5.2	62	33.3	01	4	3	50	1	0	0	0	0	0	0	0	0	0	
W	9	2	2	97	4.9	66	13.3	01	4	4	35	1	0	0	0	0	0	0	0	0	0	
W	9	2	3	97	6.4	118	30.4	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
W	9	2	4	NA	3.4	136	36.8	05	4													snag; (8)
W	9	2	5	97	7.3	141	29.9	01	4	3	65	1	0	0	0	0	0	0	0	0	0	(9)
W	9	2	6	97	3.8	150	26.8	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
W	9	2	7	97	5.4	214	17.6	05	4													snag
W	9	2	8	97	5.8	246	18.8	01	4	3	55	1	0	0	0	0	0	0	0	0	0	(10)
W	9	2	9	97	4.4	306	23.4	01	4	3	50	1	0	0	0	0	0	0	0	0	0	(11)
W	9	2	10	97	3.6	342	36.8	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
W	9	2	11	97	1.3	349	25.2	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
W	9	2	12	371	6.8	351	13.6	01	4	4	35	1	3	2	0	0	0	0	0	0	0	(12)
W	9	3	1	315	4.3	14	13.7	01	4	3	35	1	3	2	0	0	0	0	0	0	0	(13)

(1) wound ~10%, looks like its ok; (2) decayed underneath, perched on ledge; (3) died in recent years, now shows root damage by animals;
(4) wound (20%) 4' long with rot & (10%) 1' above; (5) forked long ago at 15' up, only one leader; (6) 30% wound w/ decay ~9'up; (7) crook 10' up; lost leader long ago;
(8) crack in the middle; (9) dbh measured above dead braches (at dbh); (10) deep wound near base, appears solid inside; (11) forked at 20' & 25' - 2 live leaders;
(12) 4 1" holes drilled ~3' up the bole, metal tree tag above DBH #F-21-4, this is a first rectangular tag; (13) 4'long narrow crack w/rottten wood (punk)

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	9	3	2	371	3.4	28	16.2	05	4													snag
W	9	3	3	97	6.1	104	28.5	01	4	3	50	1	0	0	0	0	0	0	0	0	0	(1)
W	9	3	4	97	2.2	144	15.2	05	4													snag; (2)
W	9	3	5	NA	4.8	150	13.0	05	4													snag
W	9	3	6	97	6.0	184	32.7	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
W	9	3	7	97	2.3	200	30.6	01	4	3	65	1	0	0	0	0	0	0	0	0	0	
W	9	3	8	97	7.0	212	27.5	01	4	4	50	1	0	0	0	0	0	0	0	0	0	(3)
W	9	3	9	97	4.4	224	27.7	01	4	3	40	1	0	0	0	0	0	0	0	0	0	
W	9	3	10	97	6.6	246	15.8	01	4	5	50	1	0	0	0	0	0	0	0	0	0	
W	9	3	11	97	3.9	272	31.0	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
W	9	3	12	97	1.3	288	17.9	01	4	4	35	1	0	0	0	0	0	0	0	0	0	
W	9	3	13	97	3.8	308	22.1	01	4	3	40	1	0	0	0	0	0	0	0	0	0	
W	9	3	14	97	3.8	350	22.6	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
W	9	3	15	97	7.0	352	33.5	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
W	9	3	16	97	5.2	354	17.7	01	4	3	40	1	0	0	0	0	0	0	0	0	0	
W	9	3	17	97	3.3	358	13.0	01	4	5	30	2	0	0	0	0	0	0	0	0	0	
W	9	4	1	97	6.5	4	24.4	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	9	4	2	97	6.4	22	14.1	01	2	5	75	1	0	0	0	0	0	0	0	0	0	
W	9	4	3	97	4.6	100	18.6	01	2	4	60	1	2	2	0	0	0	0	0	0	0	(4)
W	9	4	4	97	2.1	108	13.5	01	2	3	75	1	0	0	0	0	0	0	0	0	0	
W	9	4	5	NA	6.6	114	29.7	05	2													snag
W	9	4	6	97	4.0	148	34.8	01	2	3	60	1	2	2	0	0	0	0	0	0	0	(5)
W	9	4	7	97	7.3	160	21.3	01	2	3	45	1	1	2	0	0	0	0	0	0	0	(6)
W	9	4	8	97	7.1	176	25.4	01	2	4	60	1	6	4	8	0	0	0	0	0	0	(7)
W	9	4	9	97	5.6	200	21.6	01	2	4	55	1	0	0	0	0	0	0	0	0	0	
W	9	4	10	97	4.8	231	15.0	01	2	4	65	1	0	0	0	0	0	0	0	0	0	
W	9	4	11	97	5.1	260	17.9	01	2	4	70	1	3	3	2	0	0	0	0	0	0	(8)
W	9	4	12	97	4.5	280	23.8	01	2	3	80	1	0	0	0	0	0	0	0	0	0	(9)
W	9	4	13	97	1.6	282	18.2	01	2	5	30	2	4	3	4	0	0	0	0	0	0	(10)
W	9	4	14	NA	2.5	328	38.8	05	2													snag; (11)
W	9	4	15	97	6.5	334	16.3	01	2	4	55	1	0	0	0	0	0	0	0	0	0	

(1) narrow healing crack 8' up, appears ok; (2) broke off 1/2 above & 1/2 below dbh, 1/2 original size; (3) broken top, new leader recently (also original leader from decades ago is showing 10' up); (4) wound to the ground, narrow & lots of resin, but looks decayed; (5) 11 woodpecker holes, deep with decay & resin; (6) 30% of exposed root w/ lots of decay (8" diameter); (7) narley looking w/ lots of resin all around 20' up; borderline class 5; (8) open wound, wood appears solid; (9) small wound near stump, appears to be healing ok; (10) 5' long wound w/ peeling back bark, rot questionable; (11) conifer, spruce?

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	9	4	16	97	3.7	356	21.6	01	2	4	75	1	0	0	0	0	0	0	0	0	0	
W	9	4	17	97	4.7	356	30.9	01	2	3	35	1	0	0	0	0	0	0	0	0	0	(1)
W	10	1	1	97	5.4	18	25.7	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
W	10	1	2	935	5.0	20	13.8	01	2	5	60	1	4	2	0	6	22	2	0	0	0	(2)
W	10	1	3	97	5.9	34	28.2	01	2	3	70	1	0	0	0	0	0	0	0	0	0	
W	10	1	4	97	2.5	60	18.4	01	2	4	99	1	0	0	0	0	0	0	0	0	0	
W	10	1	5	379	6.7	74	15.6	01	2	5	70	1	2	3	2	5	3	2	6	2	0	(3)
W	10	1	6	97	5.1	204	29.9	01	2	3	70	1	6	2	0	0	0	0	0	0	0	(4)
W	10	1	7	316	3.6	260	13.7	01	2	4	50	1	2	2	0	6	3	3	0	0	0	(5)
W	10	1	8	762	5.1	274	18.4	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
W	10	1	9	316	6.5	290	17.7	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
W	10	1	10	97	4.5	300	20.8	01	2	3	75	1	0	0	0	0	0	0	0	0	0	
W	10	1	11	97	6.5	310	25.7	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	10	1	12	97	5.8	334	22.0	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
W	10	2	1	97	4.5	110	17.2	01	1	5	95	1	1	11	0	0	0	0	0	0	0	(6)
W	10	2	2	97	5.1	134	14.3	01	1	4	65	1	0	0	0	0	0	0	0	0	0	(7)
W	10	2	3	371	6.6	203	18.7	01	1	4	55	1	0	0	0	0	0	0	0	0	0	(8)
W	10	2	4	371	6.6	203	23.5	01	1	4	60	1	0	0	0	0	0	0	0	0	0	(9)
W	10	2	5	97	5.7	260	55.5	05	1													snag
W	10	2	6	371	5.9	346	21.1	01	1	4	40	1	3	3	3	0	0	0	0	0	0	(10)
W	10	2	7	371	5.9	346	13.4	01	1	4	40	1	2	2	0	0	0	0	0	0	0	(11)
W	10	2	8	371	5.9	346	18.7	01	1	4	40	1	2	2	0	6	2	0	0	0	0	(12)
W	10	2	9	371	5.9	346	21.6	01	1	4	55	1	0	0	0	0	0	0	0	0	0	(13)
W	10	2	10	371	6.4	350	14.0	05	1													snag; (14)
W	10	3	1	97	3.2	33	13.0	01	5	5	85	1	0	0	0	0	0	0	0	0	0	
W	10	3	2	97	2.4	71	43.2	01	5	3	65	1	0	0	0	0	0	0	0	0	0	(15)
W	10	3	3	371	5.4	120	17.5	01	5	4	55	1	0	0	0	0	0	0	0	0	0	
W	10	3	4	371	4.0	134	20.5	01	5	4	70	1	2	2	0	0	0	0	0	0	0	(16)
W	10	3	5	97	5.0	218	14.7	01	5	5	80	1	0	0	0	0	0	0	0	0	0	(17)

(1) multiple forks, looks deciduous almost; (2) wound w/ punk & decaying main branch (3) old branch wounds top one with rot; (4) fork at 12', one broke off & ripped 6' down the side; (5) can reach into center from below; open wound; adhered to neighboring sapling at 3'; (6) leaning at 45 angle tip-up mound with exposed roots; (7) forked at 18" & 12', one fork very small; (8) forked below dbh; (9) forked below dbh; (10) rubbing bole of tree #7 (absorbing it); shares a common stump with #9; (11) deep hole at base with rot; share common stump with tree #8; (12) deep hole at base with rot & open wounds 15" wide & 2' long; (13) shares a common stump with #6; (14) wound to ground 30% & old branch with rot; (15) 8' long healed lightning scar; (16) 2' long narrow wound with rot; (17) forked; trapped under maple #6;

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
W	10	3	6	316	2.3	236	31.5	01	5	4	75	1	2	2	0	0	0	0	0	0	0	(1)
W	10	3	7	97	5.3	309	23.7	01	5	3	55	1	6	3	5	0	0	0	0	0	0	(2)
W	10	3	8	97	6.5	326	28.0	05	5													snag; (3)
W	10	3	9	371	4.5	337	24.5	01	5	3	55	1	0	0	0	0	0	0	0	0	0	
W	10	4	1	97	0.9	111	24.0	01	1	3	80	1	4	3	5	0	0	0	0	0	0	(4)
W	10	4	2	97	0.9	111	28.8	01	1	3	75	1	0	0	0	0	0	0	0	0	0	(5)
W	10	4	3	371	4.7	111	15.8	01	1	3	70	1	2	2	0	0	0	0	0	0	0	(6)
W	10	4	4	371	6.8	140	18.3	01	1	3	55	1	3	3	4	0	0	0	0	0	0	(7)
W	10	4	5	315	5.4	180	18.3	01	1	4	35	1	2	2	0	6	3	2	0	0	0	(8)
W	10	4	6	371	3.4	202	20.7	01	1	3	40	1	3	2	0	0	0	0	0	0	0	(9)
W	10	4	7	371	0.4	232	14.3	01	1	3	45	1	2	2	0	5	2	0	0	0	0	(10)
W	10	4	8	371	0.4	232	17.1	01	1	3	50	1	2	2	0	0	0	0	0	0	0	(11)
W	10	4	9	97	5.3	232	14.6	01	1	4	35	1	0	0	0	0	0	0	0	0	0	(12)
W	10	4	10	531	4.4	254	13.0	05	1													snag; bbd
W	10	4	11	371	2.6	311	17.6	01	1	3	40	1	0	0	0	0	0	0	0	0	0	(13)
W	10	4	12	371	2.6	311	15.8	01	1	3	40	1	2	2	0	0	0	0	0	0	0	hole with rot
W	10	4	13	371	2.6	311	16.0	01	1	3	40	1	2	2	0	0	0	0	0	0	0	holes with rot
W	10	4	14	97	2.0	347	27.9	01	1	3	60	1	2	2	0	0	0	0	0	0	0	(14)

(1) deep small cavity with decayed wood; (2) forked ~30' up, one leader ripped off; (3) top broke off at 10'; (4) forked w/ common stump w/ tree #2; forked again at 10'; 2' very exposed wound; (5) forked with common stump w/ tree #1; (6) 1' long deep crack with rot; (7) decayed snag causing wound (stuck between tree and sapling); (8) several rotting wounds near ground & 1 in fork & 1 in between; wound in canopy; (9) deep hole with rot; (10) wound with decay below and above; (11) wound to ground, 50% and 18" tall; (12) forked at 5', one fork dead (12) bdh taken above swelling; (13) separate base, no decay clump left to right; (14) 50% wound w/ decay near ground 2' tall

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	1	1	1	316	3.7	150	16.6	01	7	3	35	1	2	2	0	0	0	0	0	0	0	(1)
E	1	1	2	316	3.7	150	31.9	01	7	3	50	1	2	2	0	0	0	0	0	0	0	(2)
E	1	1	3	97	4.3	252	39.0	01	7	3	60	1	0	0	0	0	0	0	0	0	0	
E	1	1	4	371	2.6	319	23.5	01	7	3	80	1	0	0	0	0	0	0	0	0	0	(3)
E	1	2	1	371	5.8	32	22.7	01	1	3	30	2	0	0	0	0	0	0	0	0	0	clumped
E	1	2	2	371	5.8	32	17.8	01	1	3	40	1	0	0	0	0	0	0	0	0	0	clumped
E	1	2	3	531	6.1	88	13.0	01	1	3	20	2	2	1	9	5	1	9	6	1	9	bbd; (4)
E	1	2	4	531	2.5	152	19.0	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	1	2	5	316	1.9	180	13.9	01	1	3	40	1	0	0	0	0	0	0	0	0	0	(5)
E	1	2	6	371	4.9	212	24.8	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
E	1	2	7	97	1.9	300	14.7	01	1	4	70	1	0	0	0	0	0	0	0	0	0	
E	1	2	8	531	4.8	326	16.4	01	1	3	15	3	2	1	9	5	1	9	6	1	9	bbd
E	1	3	1	531	4.6	9	19.2	01	1	4	35	1	2	1	9	5	1	9	6	1	5	bbd
E	1	3	2	541	1.7	94	41.8	01	1	3	30	2	0	0	0	0	0	0	0	0	0	
E	1	3	3	318	7.3	119	67.8	01	1	3	45	1	2	2	0	0	0	0	0	0	0	
E	1	3	4	371	2.9	141	13.5	01	1	4	30	2	0	0	0	0	0	0	0	0	0	
E	1	3	5	531	7.3	162	16.4	01	1	4	25	2	2	1	9	5	1	9	6	1	6	bbd
E	1	3	6	531	3.0	212	21.9	01	1	4	60	1	2	1	9	5	1	9	6	1	3	bbd
E	1	3	7	97	7.3	218	34.0	01	1	3	55	1	2	31	0	0	0	0	0	0	0	(6)
E	1	3	8	531	7.2	234	31.2	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd; (7)
E	1	3	9	531	5.8	294	16.8	05	1													snag; bbd
E	1	3	10	531	2.6	315	19.8	01	1	3	40	1	2	1	9	5	1	9	6	1	7	bbd
E	1	3	11	531	0.9	360	15.2	05	1													snag; bbd
E	1	4	1	531	1.6	10	16.0	01	7	4	30	2	2	1	9	5	1	8	6	1	6	bbd
E	1	4	2	316	5.6	78	21.5	01	7	3	40	1	2	2	0	0	0	0	0	0	0	
E	1	4	3	316	5.8	156	38.8	01	7	3	40	1	3	2	0	0	0	0	0	0	0	
E	1	4	4	531	6.3	168	33.2	01	7	3	45	1	2	1	9	5	1	9	6	1	6	bbd
E	1	4	5	531	5.6	206	16.4	05	7													snag; bbd
E	1	4	6	531	3.5	212	17.7	05	7													snag; bbd
E	1	4	7	97	5.4	218	39.5	01	7	3	55	1	0	0	0	0	0	0	0	0	0	
E	1	4	8	531	3.7	240	15.6	05	7													snag; bbd
E	1	4	9	97	6.7	250	18.5	01	7	4	45	1	0	0	0	0	0	0	0	0	0	
E	2	1	1	371	5.5	2	45.3	01	3	3	50	1	0	0	0	0	0	0	0	0	0	

(1) some lower bole wounds with punk; (2) some lower bole wounds with punk; (3) dbh taken above swelling; (4) dbh measured above fork; (5) dbh measured above split; (6) insect burrow holes and squigglys under broken off bark segment; (7) dbh taken above fork

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	2	1	2	97	5.7	44	27.5	01	3	3	50	1	5	3	6	0	0	0	0	0	0	open wound
E	2	1	3	371	6.5	84	30.3	05	3													snag
E	2	1	4	97	3.0	94	37.9	01	3	3	55	1	0	0	0	0	0	0	0	0	0	
E	2	1	5	371	6.6	130	17.0	05	3													snag
E	2	1	6	371	3.4	144	17.9	01	3	3	50	1	0	0	0	0	0	0	0	0	0	
E	2	1	7	97	5.0	178	31.6	01	3	3	35	1	0	0	0	0	0	0	0	0	0	
E	2	1	8	531	6.3	184	19.7	05	3													snag; bbd
E	2	1	9	531	7.3	196	16.8	01	3	4	40	3	2	1	9	5	1	9	6	1	9	bbd
E	2	1	10	97	7.1	208	57.0	01	3	3	45	1	0	0	0	0	0	0	0	0	0	
E	2	1	11	97	3.7	240	38.5	05	3													snag
E	2	1	12	531	3.8	302	23.5	01	3	3	40	1	2	1	9	5	1	9	6	1	5	bbd; (1)
E	2	1	13	371	3.7	302	18.1	01	3	4	30	2	2	2	0	0	0	0	0	0	0	(1)
E	2	2	1	371	7.0	12	35.5	01	1	3	45	1	2	2	0	0	0	0	0	0	0	(2)
E	2	2	2	97	6.0	64	17.0	01	1	3	70	1	0	0	0	0	0	0	0	0	0	
E	2	2	3	97	1.0	72	22.6	01	1	3	55	1	0	0	0	0	0	0	0	0	0	
E	2	2	4	97	3.9	96	25.1	01	1	3	65	1	0	0	0	0	0	0	0	0	0	
E	2	2	5	315	7.3	112	13.0	05	1													snag
E	2	2	6	316	6.5	212	28.2	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
E	2	2	7	531	0.6	218	18.1	01	1	4	50	1	2	1	9	5	1	9	6	1	8	bbd
E	2	2	8	531	5.2	280	21.8	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	2	2	9	531	3.0	354	28.0	05	1													snag; bbd
E	2	3	1	531	6.6	2	15.4	01	1	5	10	2	2	1	9	5	1	9	6	1	9	bbd; (3)
E	2	3	2	531	5.5	6	14.2	05	1													snag; bbd
E	2	3	3	531	6.2	56	30.9	01	1	5	25	2	2	1	9	5	1	9	6	1	9	bbd; (4)
E	2	3	4	531	1.3	206	24.7	05	1													snag; bbd
E	2	3	5	531	5.4	230	31.2	01	1	3	60	1	2	1	9	5	1	9	6	1	9	bbd
E	2	3	6	531	5.8	296	13.4	01	1	3	25	2	2	1	9	5	1	9	6	1	9	bbd; (5)
E	2	3	7	531	5.8	314	24.4	01	1	3	5	3	2	1	9	5	1	9	6	1	3	bbd
E	2	4	1	531	3.5	32	19.2	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd; split
E	2	4	2	531	4.6	98	20.8	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
E	2	4	3	531	0.9	218	15.4	01	1	3	55	1	2	1	9	5	1	8	6	1	7	bbd
E	2	4	4	531	4.4	232	13.5	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
E	2	4	5	97	6.6	270	17.6	01	1	5	50	1	0	0	0	0	0	0	0	0	0	

(1) dbh measured where trees #12 &13 split apart enough for tape; trees #12 &13 intertwined at the bases; tree #13 has fruiting body in wound;
(2) huge open wound winding around base & going 1/4 way up tree (~25%); (3) dead leader; (4) dead leader; (5) double canopy;

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	2	4	6	531	5.3	316	17.7	01	1	3	25	2	2	1	9	5	1	9	6	1	9	bbd
E	2	4	7	97	3.2	326	27.0	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
E	3	1	1	531	3.0	2	15.6	05	1													snag; (1)
E	3	1	2	97	5.7	60	49.4	01	1	3	40	1	2	2	0	0	0	0	0	0	0	(2)
E	3	1	3	97	6.2	62	12.8	01	1	5	50	1	0	0	0	0	0	0	0	0	0	(3)
E	3	1	4	371	4.5	90	41.2	01	1	3	45	1	1	2	0	0	0	0	0	0	0	(4)
E	3	1	5	97	5.8	134	36.4	01	1	3	55	1	5	31	0	0	0	0	0	0	0	(5)
E	3	1	6	531	4.4	214	15.3	01	1	5	15	2	2	1	9	5	1	9	6	1	9	bbd; (6)
E	3	1	7	531	2.2	238	14.0	01	1	3	60	1	2	1	3	0	0	0	0	0	0	bbd; wow (7)
E	3	1	8	531	1.8	240	14.0	01	1	3	25	2	2	1	9	5	1	3	6	1	5	bbd
E	3	1	9	97	6.2	246	14.6	01	1	5	70	1	0	0	0	0	0	0	0	0	0	(8)
E	3	2	1	97	5.7	6	32.5	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
E	3	2	2	97	7.1	18	43.1	01	4	3	65	1	0	0	0	0	0	0	0	0	0	
E	3	2	3	315	6.0	104	18.7	05	4													snag
E	3	2	4	97	1.5	126	35.7	05	4													snag; (9)
E	3	2	5	371	4.8	144	34.1	01	4	3	50	1	1	2	0	3	2	0	0	0	0	(10)
E	3	2	6	97	5.1	164	15.6	01	4	5	55	1	0	0	0	0	0	0	0	0	0	
E	3	2	7	97	2.9	194	32.0	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
E	3	2	8	531	3.0	214	12.9	05	4													snag
E	3	2	9	316	5.6	218	21.9	01	4	3	30	2	2	2	0	0	0	0	0	0	0	(11)
E	3	2	10	97	4.8	232	37.5	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
E	3	2	11	97	6.6	308	32.3	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
E	3	2	12	531	3.4	314	30.0	01	4	4	35	1	2	1	9	5	1	9	6	1	9	bbd
E	3	3	1	531	5.7	28	20.3	01	1	4	45	1	2	1	9	5	1	9	6	1	9	bbd (12)
E	3	3	2	315	4.0	74	14.7	01	1	4	40	1	0	0	0	0	0	0	0	0	0	(13)
E	3	3	3	531	3.9	92	15.6	05	1													snag; bbd(14)
E	3	3	4	531	4.0	162	13.3	01	1	4	25	1	2	1	9	5	1	9	6	1	9	bbd (15)
E	3	3	5	97	2.7	174	20.8	01	1	3	35	1	0	0	0	0	0	0	0	0	0	
E	3	3	6	97	2.5	210	25.0	01	1	3	50	1	0	0	0	0	0	0	0	0	0	
E	3	3	7	97	4.0	262	51.6	05	1													snag, (16)
E	3	3	8	97	5.9	326	20.8	01	1	4	80	1	0	0	0	0	0	0	0	0	0	

(1) dbh measured above knot; (2) fruiting body + punky wood at ground level; (3) one very small wound; (4) wound &punky wood &decaying roots above ground;
(5) branches & beech snag rubbing tree; (6) dead leaders; (7) great tree!!!; (8) forked ~30'up - 2 leaders; (9) broke about 12'up, top half is leaning on tree #1;
(10) tree suspended on roots with rot below; open wound & rot on one side 4' up; (11) mushrooms growing out of tree; (12) dbh measured above swelling; (13) dbh measure
above swelling; (14) dbh measured above swelling; (15) stump in way of horizontal distance; double canopy; (16) broken below dbh, but lots to measure, split in half;

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	3	4	1	531	6.7	18	14.0	01	1	3	40	1	2	1	9	5	1	9	6	1	8	bbd
E	3	4	2	531	6.0	28	16.4	01	1	3	15	2	2	1	9	5	1	9	6	1	3	bbd
E	3	4	3	531	6.7	46	17.1	01	1	3	35	1	2	1	9	5	1	9	6	1	3	bbd
E	3	4	4	531	6.7	62	19.0	01	1	3	40	1	2	1	9	5	1	9	6	1	3	bbd; (1)
E	3	4	5	371	2.8	70	48.3	01	1	3	50	1	1	2	0	0	0	0	0	0	0	(2)
E	3	4	6	531	6.2	84	22.1	01	1	3	55	1	2	1	9	5	1	9	6	1	2	bbd
E	3	4	7	531	7.1	134	14.5	01	1	4	25	2	2	1	9	5	1	9	6	1	3	bbd
E	3	4	8	531	7.2	140	12.7	01	1	4	30	2	2	1	9	5	1	9	6	1	4	bbd
E	3	4	9	318	2.6	164	48.5	01	1	3	55	1	0	0	0	0	0	0	0	0	0	(3)
E	3	4	10	531	5.7	236	15.6	01	1	4	30	2	2	1	9	5	1	9	6	1	5	bbd
E	3	4	11	531	5.7	236	20.0	01	1	4	25	2	2	1	9	5	1	9	6	1	9	bbd
E	3	4	12	531	6.6	266	19.6	01	1	4	25	2	2	1	9	5	1	9	6	1	8	bbd
E	3	4	13	531	5.8	300	19.8	01	1	4	15	2	2	1	9	5	1	9	6	1	7	bbd
E	3	4	14	318	3.7	316	38.3	01	1	3	40	1	3	2	0	0	0	0	0	0	0	(4)
E	3	4	15	531	4.8	346	21.1	05	1													snag; bbd
E	4	1	1	97	4.5	36	37.8	01	4	3	55	1	1	2	0	0	0	0	0	0	0	
E	4	1	2	97	1.8	50	43.3	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
E	4	1	3	97	6.7	92	42.2	01	4	3	60	1	1	2	0	3	2	0	0	0	0	(5)
E	4	1	4	97	5.9	104	14.5	01	4	4	35	1	0	0	0	0	0	0	0	0	0	
E	4	1	5	97	6.8	134	27.4	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
E	4	1	6	371	5.5	146	12.8	01	4	3	35	1	0	0	0	0	0	0	0	0	0	
E	4	1	7	97	6.1	154	15.2	01	4	3	35	1	0	0	0	0	0	0	0	0	0	
E	4	1	8	97	1.1	162	26.6	01	4	3	65	1	0	0	0	0	0	0	0	0	0	
E	4	1	9	97	7.1	164	36.1	01	4	3	65	1	0	0	0	0	0	0	0	0	0	
E	4	1	10	531	5.6	252	13.4	05	4													snag
E	4	1	11	531	5.9	270	20.6	05	4													snag; (6)
E	4	1	12	97	4.5	280	15.1	01	4	4	50	1	0	0	0	0	0	0	0	0	0	
E	4	2	1	531	7.1	44	35.5	05	5													snag; bbd
E	4	2	2	531	6.4	80	39.5	01	5	3	55	1	2	1	9	5	1	9	6	1	5	bbd
E	4	2	3	97	6.8	144	22.2	01	5	3	60	1	3	2	0	0	0	0	0	0	0	(7)
E	4	2	4	531	2.9	158	30.7	01	5	3	25	2	2	1	9	5	1	9	6	1	8	bbd
E	4	2	5	531	3.1	186	25.0	01	5	3	65	1	2	1	9	5	1	9	6	1	9	bbd
E	4	2	6	371	7.0	200	13.3	01	5	3	40	1	0	0	0	0	0	0	0	0	0	

(1) engulfing the adjacent beech sapling at the bottom; (2) punky wounds on several exposed roots; (3) few little burlies; (4) wound, looks like its rotting away and has insect holes; (5) exposed roots with holes: woodpecker holes with mushrooms inside; (6) dbh measured above swelling; (7) loss of leader but ok now

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	4	2	7	316	6.6	212	17.0	01	5	3	30	2	2	2	0	0	0	0	0	0	0	
E	4	2	8	531	7.0	220	35.1	01	5	4	25	2	2	1	9	5	1	9	6	1	9	bbd
E	4	2	9	NA	4.5	240	21.3	05	5													snag; girdled
E	4	2	10	316	4.5	240	18.7	01	5	3	45	1	3	2	0	0	0	0	0	0	0	
E	4	2	11	316	4.5	240	20.5	01	5	3	65	1	0	0	0	0	0	0	0	0	0	
E	4	2	12	531	4.7	344	14.0	01	5	4	20	3	2	1	9	5	1	9	6	1	9	bbd
E	4	3	1	371	6.0	20	20.1	01	1	3	30	2	2	2	0	0	0	0	0	0	0	
E	4	3	2	371	6.0	20	19.2	01	1	3	45	1	2	2	0	0	0	0	0	0	0	
E	4	3	3	371	3.9	50	14.5	01	1	3	30	2	1	2	0	0	0	0	0	0	0	
E	4	3	4	371	6.4	52	15.8	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
E	4	3	5	371	1.0	62	13.3	05	1													snag
E	4	3	6	371	7.1	68	18.3	01	1	3	50	1	0	0	0	0	0	0	0	0	0	
E	4	3	7	371	6.7	124	16.9	01	1	3	35	1	1	2	0	0	0	0	0	0	0	
E	4	3	8	318	7.3	134	12.7	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
E	4	3	9	316	5.6	170	25.4	01	1	3	55	1	0	0	0	0	0	0	0	0	0	
E	4	3	10	371	4.0	182	17.4	05	1													snag
E	4	3	11	371	6.3	196	18.5	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
E	4	3	12	371	3.7	254	16.6	01	1	3	45	1	2	2	0	0	0	0	0	0	0	
E	4	3	13	531	3.3	296	17.9	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	4	4	1	97	1.0	24	17.6	01	6	3	30	2	0	0	0	0	0	0	0	0	0	
E	4	4	2	316	2.8	34	13.4	01	6	3	25	2	0	0	0	0	0	0	0	0	0	(1)
E	4	4	3	316	3.6	44	20.8	01	6	3	35	1	3	2	0	0	0	0	0	0	0	(2)
E	4	4	4	97	2.7	50	23.7	01	6	3	35	1	0	0	0	0	0	0	0	0	0	
E	4	4	5	12	4.2	100	26.5	01	6	3	30	2	0	0	0	0	0	0	0	0	0	
E	4	4	6	97	2.4	126	27.9	01	6	3	70	1	0	0	0	0	0	0	0	0	0	
E	4	4	7	97	7.2	130	14.3	01	6	3	60	1	6	3	5	0	0	0	0	0	0	
E	4	4	8	12	5.8	168	19.8	01	6	3	40	1	0	0	0	0	0	0	0	0	0	
E	4	4	9	97	1.9	190	12.7	01	6	4	30	2	0	0	0	0	0	0	0	0	0	
E	4	4	10	316	2.6	214	18.3	01	6	3	45	1	0	0	0	0	0	0	0	0	0	(3)
E	4	4	11	371	5.6	228	17.0	01	6	3	35	1	2	2	0	0	0	0	0	0	0	(4)
E	4	4	12	97	0.8	252	28.4	01	6	3	65	1	0	0	0	0	0	0	0	0	0	
E	4	4	13	371	6.5	262	19.6	01	6	3	55	1	0	0	0	0	0	0	0	0	0	
E	4	4	14	12	4.4	324	16.5	01	6	3	55	1	0	0	0	0	0	0	0	0	0	
E	4	4	15	97	5.2	346	15.7	01	6	3	25	2	0	0	0	0	0	0	0	0	0	

(1) dbh measured above knot; (2) dbh measured above knot; tree has burls; (3) burls up higher maybe; (4) big wound ~50%

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	4	4	16	97	5.2	358	18.8	01	6	3	50	1	0	0	0	0	0	0	0	0	0	
E	5	1	1	97	7.3	6	15.6	01	5	4	45	1	0	0	0	0	0	0	0	0	0	
E	5	1	2	316	6.4	26	17.7	01	5	3	30	2	0	0	0	0	0	0	0	0	0	
E	5	1	3	531	6.0	32	13.2	01	5	4	25	2	2	1	9	5	1	9	6	1	9	bbd
E	5	1	4	531	2.6	40	21.7	01	5	3	35	1	2	1	9	5	1	5	6	1	3	bbd; (1)
E	5	1	5	97	2.7	44	15.2	01	5	5	55	1	0	0	0	0	0	0	0	0	0	(2)
E	5	1	6	97	6.7	62	15.3	01	5	4	50	1	0	0	0	0	0	0	0	0	0	(3)
E	5	1	7	97	3.0	78	23.9	01	5	3	55	1	0	0	0	0	0	0	0	0	0	
E	5	1	8	97	5.2	100	18.7	01	5	5	45	1	0	0	0	0	0	0	0	0	0	(4)
E	5	1	9	531	4.1	120	15.1	01	5	4	40	1	2	1	9	5	1	9	6	1	9	bbd
E	5	1	10	371	6.7	140	23.9	01	5	3	50	1	0	0	0	0	0	0	0	0	0	
E	5	1	11	531	4.5	144	13.3	01	5	3	45	1	2	1	9	5	1	9	6	1	5	bbd
E	5	1	12	531	4.9	150	14.2	01	5	3	50	1	2	1	9	5	1	9	6	1	7	bbd
E	5	1	13	97	3.0	206	12.9	01	5	5	15	2	6	21	3	0	0	0	0	0	0	(5)
E	5	1	14	316	5.3	240	21.3	01	5	3	45	1	0	0	0	0	0	0	0	0	0	(6)
E	5	1	15	316	1.2	308	23.7	01	5	3	35	1	3	2	0	0	0	0	0	0	0	(7)
E	5	1	16	316	3.4	322	18.8	01	5	3	45	1	3	2	0	0	0	0	0	0	0	(8)
E	5	1	17	97	5.4	344	28.3	01	5	3	60	1	0	0	0	0	0	0	0	0	0	
E	5	2	1	316	6.8	20	31.4	01	7	3	45	1	0	0	0	0	0	0	0	0	0	
E	5	2	2	531	6.2	46	13.8	01	7	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	5	2	3	97	2.1	68	33.5	01	7	3	60	1	0	0	0	0	0	0	0	0	0	
E	5	2	4	531	4.9	68	14.2	01	7	3	25	2	2	1	9	5	1	9	6	1	9	bbd
E	5	2	5	97	5.1	88	13.6	05	7													snag
E	5	2	6	371	6.5	94	40.9	01	7	3	45	1	0	0	0	0	0	0	0	0	0	
E	5	2	7	371	6.7	134	55.5	01	7	3	30	2	2	2	0	5	2	0	0	0	0	(9)
E	5	2	8	97	7.0	188	25.6	01	7	3	55	1	0	0	0	0	0	0	0	0	0	
E	5	2	9	371	6.5	258	18.6	01	7	4	40	1	0	0	0	0	0	0	0	0	0	
E	5	2	10	NA	4.6	286	17.3	05	7													snag
E	5	2	11	316	5.3	304	14.9	01	7	3	55	1	0	0	0	0	0	0	0	0	0	
E	5	2	12	316	5.1	308	17.9	01	7	3	30	2	0	0	0	0	0	0	0	0	0	
E	5	2	13	531	5.5	342	12.9	05	7													snag
E	5	3	1	531	5.7	34	13.9	01	5	3	20	2	2	1	9	5	1	9	6	1	7	bbd

(1) dbh measured below swelling; (2) forked ~18'up-both leaders alive; (3) forked ~10' up-smaller leader looks dead; (4) old leader broke-another branch assuming dominance; (5) multiple new leaders trying but all dead so far; (6) dead branch 3'up that's still on tree but no punky wood around it; (7) decayed section-bark cracked outside (8) small old branch wound with punky wood; (9) open wound decaying 50% of tree face ~1/3 way up whole tree

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	5	3	2	531	5.7	38	13.4	01	5	3	30	2	2	1	9	5	1	9	6	1	4	bbd
E	5	3	3	316	2.6	52	14.4	01	5	3	45	1	0	0	0	0	0	0	0	0	0	(1)
E	5	3	4	316	2.4	54	15.4	01	5	3	50	1	0	0	0	0	0	0	0	0	0	(1)
E	5	3	5	316	3.1	60	17.6	01	5	3	30	2	2	2	0	0	0	0	0	0	0	
E	5	3	6	316	5.7	84	15.6	01	5	3	35	1	3	2	0	0	0	0	0	0	0	(2)
E	5	3	7	531	6.5	120	13.2	01	5	5	45	1	2	1	9	5	1	9	6	1	9	bbd; (3)
E	5	3	8	316	5.2	124	13.2	01	5	3	25	2	2	2	0	0	0	0	0	0	0	(4)
E	5	3	9	316	5.2	124	16.0	01	5	3	35	1	2	2	0	0	0	0	0	0	0	(4)
E	5	3	10	316	5.0	128	13.4	01	5	4	20	2	6	22	2	0	0	0	0	0	0	(5)
E	5	3	11	316	3.7	146	13.1	01	5	3	25	2	2	2	0	0	0	0	0	0	0	(6)
E	5	3	12	97	6.9	156	16.3	01	5	5	45	1	0	0	0	0	0	0	0	0	0	(7)
E	5	3	13	316	1.3	158	15.3	01	5	3	35	1	0	0	0	0	0	0	0	0	0	
E	5	3	14	316	4.4	172	13.2	01	5	3	25	2	2	2	0	0	0	0	0	0	0	
E	5	3	15	316	6.0	178	24.4	01	5	3	45	1	2	2	0	0	0	0	0	0	0	(8)
E	5	3	16	12	5.2	186	23.3	01	5	3	30	2	0	0	0	0	0	0	0	0	0	
E	5	3	17	97	4.3	186	20.0	01	5	3	65	1	0	0	0	0	0	0	0	0	0	
E	5	3	18	316	6.1	218	17.2	01	5	3	40	1	0	0	0	0	0	0	0	0	0	(9)
E	5	3	19	97	7.1	236	32.1	01	5	3	55	1	3	3	4	0	0	0	0	0	0	(10)
E	5	3	20	316	3.8	272	20.3	01	5	3	30	2	2	2	0	0	0	0	0	0	0	(11)
E	5	3	21	531	6.3	280	30.3	01	5	3	60	1	2	1	9	5	1	9	6	1	3	bbd
E	5	3	22	316	1.2	280	12.8	01	5	3	30	2	0	0	0	0	0	0	0	0	0	
E	5	3	23	316	1.2	280	13.2	01	5	3	30	2	2	2	0	0	0	0	0	0	0	
E	5	3	24	97	3.8	300	23.5	01	5	3	45	1	0	0	0	0	0	0	0	0	0	
E	5	4	1	97	5.2	12	13.8	01	2	5	80	1	0	0	0	0	0	0	0	0	0	
E	5	4	2	NA	3.8	28	15.4	05	2													snag
E	5	4	3	NA	4.0	78	13.7	05	2													snag; (12)
E	5	4	4	97	4.2	140	17.1	01	2	4	60	1	0	0	0	0	0	0	0	0	0	
E	5	4	5	531	5.6	152	16.8	01	2	5	35	1	2	1	9	5	1	9	6	1	9	bbd
E	5	4	6	531	5.7	184	16.4	05	2													snag; bbd
E	5	4	7	316	3.1	204	44.7	01	2	3	50	1	2	2	0	0	0	0	0	0	0	(13)
E	5	4	8	97	1.4	228	18.5	01	2	3	35	1	0	0	0	0	0	0	0	0	0	(14)

(1) tree #3 & 4 are same clump; (2) small deep hole in bark; (3) top half of tree is dead; (4) trees #8,9,10 are clump; trees#8 & 9 are one tree - forked below DBH; trees #8 & 9 have deep hole - 1/2 tree trunk; (5) trees #8,9,10 are clump; (6) decay inside wound; (7) forked 20' up, new leader; (8) open wound-decayed wood inside; (9) growing around adjacent dead sapling; (10) someone cut a 1" tall slice (by 2" deep) out of face 3' above ground (previous study tree #23); (11) deep hole w/punky wood; (12) might be a beech; (13) 2 trees have grown together at base into one; (14) small crack 2' up base (potential decay entry point)

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	5	4	9	531	3.3	228	15.3	05	2													snag
E	5	4	10	97	3.0	308	26.7	01	2	3	40	1	2	2	0	0	0	0	0	0	0	(1)
E	5	4	11	97	6.1	310	36.4	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
E	5	4	12	97	3.1	336	24.0	01	2	3	65	1	4	2	0	0	0	0	0	0	0	(2)
E	5	4	13	97	4.1	336	20.9	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
E	6	1	1	316	6.8	28	19.0	01	1	4	40	1	2	2	0	0	0	0	0	0	0	(3)
E	6	1	2	371	6.5	34	55.2	01	1	3	55	1	2	2	0	5	2	0	0	0	0	(4)
E	6	1	3	97	7.0	46	17.0	01	1	4	45	1	0	0	0	0	0	0	0	0	0	
E	6	1	4	97	4.6	60	18.9	01	1	5	60	1	0	0	0	0	0	0	0	0	0	
E	6	1	5	371	6.5	126	36.5	01	1	3	65	1	3	2	0	0	0	0	0	0	0	(5)
E	6	1	6	97	2.5	140	23.0	01	1	3	70	1	0	0	0	0	0	0	0	0	0	
E	6	1	7	371	7.3	154	17.0	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
E	6	1	8	371	6.4	156	17.2	01	1	3	50	1	0	0	0	0	0	0	0	0	0	
E	6	1	9	318	6.7	208	17.6	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
E	6	1	10	97	6.4	226	41.5	01	1	3	65	1	0	0	0	0	0	0	0	0	0	(6)
E	6	1	11	97	4.9	344	42.0	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
E	6	2	1	531	6.4	26	23.2	01	4	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	6	2	2	97	5.0	84	29.6	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
E	6	2	3	97	4.9	134	24.2	01	4	3	35	1	0	0	0	0	0	0	0	0	0	forked 25' up
E	6	2	4	97	6.5	136	32.1	01	4	3	70	1	0	0	0	0	0	0	0	0	0	forked 25' up
E	6	2	5	97	5.4	186	40.3	01	4	4	35	2	6	21	5	0	0	0	0	0	0	(7)
E	6	2	6	97	1.1	224	27.6	01	4	3	45	1	3	2	0	0	0	0	0	0	0	(8)
E	6	2	7	371	5.7	312	17.5	05	4													snag; (9)
E	6	2	8	531	6.6	334	20.7	01	4	3	35	1	2	1	9	5	1	9	6	1	9	bbd
E	6	2	9	371	2.2	350	33.1	01	4	3	50	1	0	0	0	0	0	0	0	0	0	
E	6	3	1	97	5.8	2	15.7	01	2	5	60	1	0	0	0	0	0	0	0	0	0	
E	6	3	2	371	6.5	60	20.1	01	2	5	60	1	5	2	0	0	0	0	0	0	0	(10)
E	6	3	3	97	7.3	130	16.4	01	2	4	50	1	0	0	0	0	0	0	0	0	0	
E	6	3	4	97	6.0	178	20.4	01	2	5	50	1	1	11	0	0	0	0	0	0	0	(11)
E	6	3	5	97	6.9	190	19.4	05	2													(12)

(1) wound that's hollow a long way in; swelling about 15' up; (2) 2 different wounds on bole; crooked near top; (3) 50% open wound that's rotting;
(4) 20' long wound-center wood is rotting away up to 50% wide; (5) 1'long rotting area-looks like it absorbed another limb or sapling; (6) forked over 35' up;
(7) broken off crown-no new leader yet (35' up); (8) 10' up-wound appears old & decayed (30% & 6" tall); (9) leaning on tree #9;
(10) old branch wound with decomposing wood inside (20%); forked above DBH; (11) tipped over 45-50 degree angle, roots still enclosed in soil;
(12) snag; tip-up mound-tree at 40 angle, most of roots torn & exposed

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	6	3	6	316	2.9	204	17.1	01	2	4	80	1	0	0	0	0	0	0	0	0	0	(1)
E	6	3	7	97	5.8	204	35.8	05	2													snag;(2)
E	6	3	8	97	6.4	316	23.0	01	2	5	55	1	0	0	0	0	0	0	0	0	0	(3)
E	6	4	1	316	4.7	100	23.1	01	5	3	40	1	0	0	0	0	0	0	0	0	0	
E	6	4	2	531	6.2	128	16.0	01	5	4	60	1	2	1	9	5	1	9	6	1	9	bbd
E	6	4	3	371	1.4	132	20.3	01	5	3	50	1	0	0	0	0	0	0	0	0	0	
E	6	4	4	316	6.3	134	21.2	01	5	3	35	1	0	0	0	0	0	0	0	0	0	
E	6	4	5	531	6.9	154	13.0	05	5													snag; bbd
E	6	4	6	531	3.7	232	23.4	01	5	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	6	4	7	531	6.8	242	15.4	05	5													snag; bbd
E	6	4	8	531	7.1	266	13.4	01	5	5	45	1	2	1	9	5	1	9	6	1	9	bbd
E	6	4	9	531	5.7	326	16.5	01	5	3	55	1	1	1	9	0	0	0	0	0	0	(4)
E	6	4	10	316	6.8	356	26.8	01	5	3	45	1	0	0	0	0	0	0	0	0	0	
E	7	1	1	531	3.9	20	14.2	05	5													snag; bbd
E	7	1	2	531	0.8	32	16.0	01	5	4	30	2	2	1	9	5	1	9	6	1	9	bbd; (5)
E	7	1	3	531	2.9	84	13.0	01	5	4	65	1	2	1	9	5	1	9	6	1	8	bbd
E	7	1	4	97	6.0	90	15.0	01	5	3	55	1	0	0	0	0	0	0	0	0	0	forked 15'up
E	7	1	5	NA	3.3	158	29.5	05	5													snag
E	7	1	6	316	6.0	174	23.3	01	5	3	60	1	0	0	0	0	0	0	0	0	0	
E	7	1	7	531	6.6	176	15.0	01	5	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	7	1	8	531	7.2	178	29.3	01	5	3	65	1	2	1	9	5	1	9	6	1	9	bbd
E	7	1	9	531	6.8	230	13.9	01	5	3	35	1	2	1	9	5	1	9	6	1	3	bbd, (6)
E	7	1	10	316	1.2	242	25.5	01	5	3	50	1	0	0	0	0	0	0	0	0	0	
E	7	1	11	531	5.5	248	27.1	01	5	3	60	1	2	1	9	5	1	9	6	1	9	bbd
E	7	1	12	97	6.1	264	31.3	01	5	3	50	1	0	0	0	0	0	0	0	0	0	(7)
E	7	1	13	531	2.7	288	16.8	01	5	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	7	1	14	531	5.9	296	14.4	01	5	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	7	1	15	531	1.0	324	28.6	01	5	3	70	1	2	1	9	5	1	9	6	1	9	bbd
E	7	1	16	531	3.2	348	15.3	05	5													snag
E	7	2	1	97	1.3	2	12.8	01	3	5	25	2	0	0	0	0	0	0	0	0	0	(8)
E	7	2	2	371	5.7	4	51.8	01	3	3	40	1	2	2	0	5	2	0	0	0	0	(9)

(1) 1" wide x 1' long scar healing; (2) tip-up mound with exposed roots, tree at 50 degree angle; (3) growing up under big yellow birch, so its squashed;
(4) cankers at base of exposed roots and stump; (5) dbh measured above fork; (6) not so severe!; (7) forked at 20'; Increment bore holes & round tag#68 at base;
(8) lost leader 3 times (8',18',20'up), now under tree#16's bole; (9) wound 50% winds up tree, whole heart is rotting out;

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	7	2	3	318	4.9	28	12.7	01	3	5	60	1	4	2	0	0	0	0	0	0	0	(1)
E	7	2	4	531	2.6	84	19.7	05	3													snag; bbd;(2)
E	7	2	5	318	3.3	90	18.3	01	3	4	50	1	0	0	0	0	0	0	0	0	0	
E	7	2	6	531	4.3	122	31.0	01	3	3	60	1	2	1	9	5	1	9	6	1	9	bbd
E	7	2	7	531	5.6	206	31.9	01	3	4	60	1	2	1	9	5	1	9	6	1	9	bbd
E	7	2	8	97	6.6	206	14.0	01	3	5	75	1	0	0	0	0	0	0	0	0	0	
E	7	2	9	531	4.0	208	23.7	01	3	4	70	1	2	1	9	5	1	9	6	1	9	bbd
E	7	2	10	97	5.7	226	28.0	01	3	3	60	1	0	0	0	0	0	0	0	0	0	(3)
E	7	2	11	97	3.5	244	32.7	01	3	3	60	1	0	0	0	0	0	0	0	0	0	(4)
E	7	2	12	97	6.1	272	28.8	01	3	3	30	2	0	0	0	0	0	0	0	0	0	(5)
E	7	2	13	97	5.4	272	14.4	05	3													snag
E	7	2	14	531	5.5	298	30.5	01	3	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	7	2	15	97	1.6	310	23.6	01	3	3	50	1	0	0	0	0	0	0	0	0	0	(6)
E	7	2	16	531	3.0	318	14.3	01	3	4	25	2	2	1	9	5	1	9	6	1	8	bbd
E	7	2	17	531	3.9	352	12.8	01	3	3	80	1	2	1	9	5	1	9	6	1	9	bbd
E	7	3	1	531	2.7	4	17.6	01	1	5	50	1	2	1	9	5	1	9	6	1	9	bbd
E	7	3	2	318	3.1	18	16.0	01	1	4	60	1	0	0	0	0	0	0	0	0	0	
E	7	3	3	97	5.8	52	22.0	01	1	4	60	1	2	2	0	0	0	0	0	0	0	(7)
E	7	3	4	531	4.5	86	15.5	01	1	5	80	1	2	1	9	5	1	9	6	1	9	bbd, (8)
E	7	3	5	97	4.3	196	20.7	01	1	3	65	1	0	0	0	0	0	0	0	0	0	
E	7	3	6	97	2.0	196	20.3	01	1	5	80	1	0	0	0	0	0	0	0	0	0	(9)
E	7	3	7	315	4.4	224	12.8	05	1													snag
E	7	3	8	316	3.5	250	24.7	01	1	3	50	1	2	2	0	0	0	0	0	0	0	(10)
E	7	3	9	531	6.8	276	14.4	01	1	3	85	1	2	1	9	5	1	9	6	1	9	bbd
E	7	3	10	97	4.9	290	24.4	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
E	7	3	11	315	3.6	292	19.4	01	1	4	45	1	4	2	0	0	0	0	0	0	0	(11)
E	7	3	12	531	5.5	316	14.5	05	1													snag; bbd
E	7	4	1	97	2.8	6	18.1	01	2	4	75	1	0	0	0	0	0	0	0	0	0	
E	7	4	2	316	5.0	78	13.4	01	2	5	45	1	2	2	0	0	0	0	0	0	0	(12)
E	7	4	3	316	4..8	80	17.2	01	2	5	45	1	3	2	0	0	0	0	0	0	0	(13)

(1) several wounds (20%) with rot; dbh taken below swelling; (2) fell down fall of 1997; (3) increment bore holes; round tag#42 at base & oval tag at DBH #89;
(4) increment bore holes; round tag#41 at base & oval tag at DBH #88, round tag at base #41; (5) incorporating spruce snag in stump; (6) lost leader 18'up a long time ago;
(7) 2 wounds (10% + 20%) with rot inside; oval tree tag at DBH # 326; (8) very sick; (9) new leader has taken over at top; (10) 30% open wound-wood is rotting away
(30" tall); (11) absorbing 531 sapling at base& crack 3' up with punk & branch has rubbed open wound with decay; (12) wound to the ground 2" wide & high;
(13) 3" deep hole with punky wood from branch wound

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	7	4	4	97	2.8	92	36.4	01	2	3	60	1	0	0	0	0	0	0	0	0	0	(1)
E	7	4	5	97	6.8	132	27.4	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
E	7	4	6	97	4.1	142	19.4	01	2	5	25	2	6	21	2	0	0	0	0	0	0	(2)
E	7	4	7	97	3.9	184	30.0	01	2	3	55	1	0	0	0	0	0	0	0	0	0	(3)
E	7	4	8	97	6.7	196	17.9	01	2	5	35	1	6	21	3	0	0	0	0	0	0	broken top
E	7	4	9	97	7.2	204	24.2	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
E	7	4	10	316	7.2	246	17.7	01	2	4	45	1	2	2	0	0	0	0	0	0	0	(4)
E	7	4	11	97	5.7	286	21.7	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
E	7	4	12	371	1.5	312	35.7	01	2	3	50	1	2	2	0	0	0	0	0	0	0	(5)
E	7	4	13	97	3.0	318	15.4	01	2	5	45	1	0	0	0	0	0	0	0	0	0	
E	7	4	14	97	6.6	348	23.7	01	2	3	65	1	0	0	0	0	0	0	0	0	0	(6)
E	7	4	15	97	5.4	358	19.2	01	2	4	60	1	0	0	0	0	0	0	0	0	0	
E	8	1	1	531	5.4	10	13.5	05	1													snag; bbd
E	8	1	2	531	4.5	38	14.5	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd
E	8	1	3	318	5.8	52	14.1	01	1	3	65	1	0	0	0	0	0	0	0	0	0	
E	8	1	4	316	5.4	68	19.2	01	1	3	55	1	2	2	0	0	0	0	0	0	0	
E	8	1	5	97	1.5	96	32.8	01	1	3	55	1	0	0	0	0	0	0	0	0	0	
E	8	1	6	531	4.3	124	19.0	01	1	4	20	3	2	1	9	5	1	9	6	1	9	bbd
E	8	1	7	531	6.5	130	24.9	05	1													snag; bbd
E	8	1	8	531	5.0	164	19.3	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
E	8	1	9	531	2.2	186	14.0	05	1													snag, bbd
E	8	1	10	531	5.8	220	18.2	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	8	1	11	531	5.1	238	15.0	01	1	3	35	1	2	1	9	5	1	9	6	1	7	bbd
E	8	1	12	531	2.8	248	14.4	01	1	3	75	1	2	1	9	5	1	9	6	1	9	bbd
E	8	1	13	531	5.6	268	17.3	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	8	1	14	531	5.0	288	17.0	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
E	8	1	15	531	6.8	296	17.7	01	1	4	55	1	2	1	9	5	1	9	6	1	9	bbd
E	8	1	16	531	4.0	342	31.8	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
E	8	2	1	NA	1.3	32	13.2	05	1													snag
E	8	2	2	371	2.9	50	17.7	01	1	3	35	1	0	0	0	0	0	0	0	0	0	
E	8	2	3	371	5.2	66	15.3	01	1	3	60	1	2	2	0	0	0	0	0	0	0	
E	8	2	4	371	2.4	82	18.0	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
E	8	2	5	97	5.5	90	28.2	01	1	3	30	2	2	2	0	0	0	0	0	0	0	(7)

(1) round tree tag at base #30; (2) has a snag leaning on it; (3) round tag at base of tree #29; (4) 2"x2" wound to ground, looks solid;
(5) 12" wide x 24" wound & small holes-both with decay,fungi,& rot; (6) absorbing old leader at 6', very tall tree; (7) large open wound to ground 20% wide & 4' high

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	8	2	6	97	3.2	100	21.7	01	1	3	35	1	0	0	0	0	0	0	0	0	0	
E	8	2	7	97	6.0	100	15.3	05	1													snag
E	8	2	8	97	3.5	142	25.1	01	1	3	50	1	2	2	0	0	0	0	0	0	0	(1)
E	8	2	9	97	6.5	142	29.4	01	1	3	50	1	2	2	0	0	0	0	0	0	0	(2)
E	8	2	10	97	4.1	180	30.3	01	1	3	55	1	2	2	0	0	0	0	0	0	0	(3)
E	8	2	11	97	6.9	192	32.5	01	1	3	60	1	3	2	0	0	0	0	0	0	0	(4)
E	8	2	12	NA	5.5	210	16.8	05	1													snag
E	8	2	13	97	4.9	276	18.9	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
E	8	2	14	531	4.2	288	13.7	05	1													snag; bbd
E	8	2	15	531	7.2	306	12.8	05	1													snag; bbd
E	8	2	16	371	4.3	320	23.1	01	1	3	45	1	2	2	0	0	0	0	0	0	0	(5)
E	8	2	17	318	3.3	326	15.8	01	1	3	50	1	2	2	0	5	1	6	0	0	0	(6)
E	8	2	18	316	7.0	336	19.2	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
E	8	3	1	531	4.7	20	18.7	01	1	3	40	1	2	1	9	5	1	9	6	1	8	bbd
E	8	3	2	531	7.3	56	13.6	01	1	3	30	2	2	1	9	5	1	9	6	1	8	bbd
E	8	3	3	531	4.1	82	26.3	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	8	3	4	531	4.4	88	23.6	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	8	3	5	531	3.3	104	12.7	01	1	4	50	1	2	1	9	5	1	9	6	1	9	bbd
E	8	3	6	531	4.6	160	14.3	01	1	5	25	2	2	1	9	5	1	9	6	1	9	bbd
E	8	3	7	531	3.0	174	19.9	01	1	3	45	1	2	1	8	5	1	8	6	1	7	bbd
E	8	3	8	531	3.3	204	14.7	01	1	3	70	1	2	1	9	5	1	7	6	1	6	bbd
E	8	3	9	531	4.7	244	15.0	01	1	3	45	1	2	1	9	5	1	6	6	1	4	bbd
E	8	3	10	531	5.6	250	23.6	01	1	3	65	1	2	1	9	5	1	9	6	1	9	bbd
E	8	3	11	531	6.3	264	22.0	01	1	3	50	1	2	1	9	5	1	9	6	1	8	bbd
E	8	3	12	531	5.3	352	22.7	01	1	3	30	2	2	1	9	5	1	7	6	1	5	bbd
E	8	3	13	531	6.7	352	17.4	01	1	3	60	1	2	1	9	5	1	8	6	1	7	bbd
E	8	3	14	531	1.2	360	16.6	01	1	3	35	1	2	1	9	5	1	9	6	1	6	bbd
E	8	4	1	NA	3.5	24	15.0	05	1													snag; conifer
E	8	4	2	97	6.2	30	26.0	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
E	8	4	3	NA	5.5	60	15.3	05	1													snag; conifer
E	8	4	4	97	3.1	70	35.7	01	1	3	55	1	0	0	0	0	0	0	0	0	0	
E	8	4	5	371	5.1	100	48.0	01	1	4	70	1	2	2	0	0	0	0	0	0	0	(7)

(1) large open wound to ground 60% wide, 2' high; woodpecker holes; (2) small wound to ground 2" wide & 1' tall; (3) small wound to ground 4" wide & 1' tall;
(4) slit in bark-goes very deep to heart wood, not healing; (5) fruiting body-mushroom; (6) fruiting body at ground; holes with decay higher; canker above 1/2 way;
(7) #5 is a fork off #6

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	8	4	6	371	5.1	100	15.9	01	1	3	55	1	2	2	0	5	2	0	6	2	0	(1)
E	8	4	7	531	4.2	122	22.4	01	1	3	75	1	2	1	9	5	1	9	6	1	9	bbd
E	8	4	8	97	1.2	130	18.3	01	1	4	55	1	0	0	0	0	0	0	0	0	0	
E	8	4	9	97	2.4	162	17.7	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
E	8	4	10	531	6.0	166	14.6	01	1	3	25	2	2	1	9	5	1	9	6	1	9	bbd
E	8	4	11	531	5.5	174	28.3	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	8	4	12	531	6.9	200	21.9	01	1	5	35	1	2	1	9	5	1	9	6	1	9	bbd
E	8	4	13	97	3.9	254	22.8	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
E	8	4	14	531	6.9	264	18.8	01	1	4	45	2	2	1	9	5	1	9	6	1	5	bbd
E	8	4	15	NA	6.6	286	24.8	05	1													snag; bbd?
E	8	4	16	97	2.7	310	22.3	01	1	3	55	1	2	2	0	0	0	0	0	0	0	(2)
E	9	1	1	531	2.6	8	13.3	05	1													snag; bbd
E	9	1	2	318	4.9	18	13.3	01	1	3	30	2	2	2	0	0	0	0	0	0	0	(3)
E	9	1	3	531	1.7	20	17.8	01	1	5	50	1	2	1	9	5	1	9	6	1	8	bbd, (4)
E	9	1	4	531	2.4	46	15.6	01	1	3	35	1	2	1	9	5	1	9	6	1	6	bbd
E	9	1	5	531	6.8	56	20.9	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	9	1	6	531	4.4	104	21.6	01	1	3	55	1	2	1	9	5	1	9	6	1	8	bbd
E	9	1	7	531	5.0	114	35.6	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	9	1	8	531	4.9	170	46.0	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
E	9	1	9	531	4.4	171	19.5	01	1	4	40	2	2	1	9	5	1	9	6	1	9	bbd, (5)
E	9	1	10	531	6.8	184	22.4	05	1													snag; bbd
E	9	1	11	531	3.2	196	13.0	01	1	5	45	1	2	1	9	5	1	9	6	1	8	bbd
E	9	1	12	531	4.9	213	26.6	01	1	3	50	1	1	1	9	0	0	0	0	0	0	bbd, but (6)
E	9	1	13	531	6.5	235	20.9	01	1	3	50	1	2	1	9	5	1	6	6	1	7	bbd
E	9	1	14	531	4.7	238	13.2	05	1													snag
E	9	1	15	531	1.0	242	13.3	01	1	3	35	1	2	1	9	5	1	8	6	1	7	bbd
E	9	1	16	531	4.2	248	16.7	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd
E	9	1	17	531	7.3	248	13.8	01	1	3	35	1	2	1	9	5	1	9	6	1	8	bbd
E	9	1	18	531	5.6	248	14.4	05	1													snag; bbd
E	9	1	19	531	6.8	267	17.7	01	1	3	45	1	2	1	9	5	1	8	6	1	8	bbd
E	9	1	20	531	4.9	318	19.2	01	1	3	55	1	2	1	9	5	1	9	6	1	7	bbd, (7)
E	9	1	21	531	2.0	318	20.9	01	1	3	25	2	2	1	9	5	1	9	6	1	8	bbd

(1) whole inside is gone-large open cavity (50%); (2) fruiting body by roots; forks at 18' up, only one main leader; (3) small hole with white fungus growth & large open wound above; (4) broken off top; (5) barely alive; (6) very little bbd, great tree!!!; (7) dead top 2/3 of tree

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	9	1	22	318	3.8	356	20.8	01	1	4	50	1	4	2	0	6	2	0	0	0	0	(1)
E	9	2	1	531	4.9	24	21.0	05	1													snag; bbd
E	9	2	2	97	4.4	26	24.7	01	1	3	40	1	3	2	0	0	0	0	0	0	0	(2)
E	9	2	3	531	3.1	30	13.3	01	1	3	80	1	2	1	9	5	1	9	6	1	9	bbd
E	9	2	4	531	1.2	34	14.7	01	1	4	35	1	2	1	9	5	1	9	6	1	9	bbd
E	9	2	5	531	3.7	54	20.5	01	1	3	65	1	2	1	9	5	1	9	6	1	9	bbd
E	9	2	6	97	4.0	86	17.9	01	1	3	30	2	1	2	0	0	0	0	0	0	0	(3)
E	9	2	7	97	5.1	108	14.2	05	1													snag; (4)
E	9	2	8	531	0.8	136	17.5	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
E	9	2	9	531	1.7	154	15.9	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	9	2	10	318	2.6	162	13.1	01	1	5	60	1	0	0	0	0	0	0	0	0	0	(5)
E	9	2	11	NA	6.1	186	14.1	05	1													snag; (6)
E	9	2	12	531	1.0	238	15.1	05	1													snag; bbd
E	9	2	13	97	5.8	250	39.7	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
E	9	2	14	97	2.7	260	18.5	05	1													snag
E	9	2	15	531	6.9	274	18.8	01	1	4	40	1	2	1	9	5	1	9	6	1	9	bbd
E	9	2	16	531	1.3	278	26.0	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
E	9	2	17	531	6.9	298	38.4	01	1	3	60	1	2	1	9	5	1	9	6	1	9	bbd, (7)
E	9	2	18	531	3.7	316	18.5	01	1	3	35	1	2	1	9	5	1	9	6	1	8	bbd
E	9	2	19	531	5.5	340	13.1	01	1	3	25	2	2	1	9	5	1	9	6	1	9	bbd
E	9	2	20	531	4.9	346	15.2	05	1													snag
E	9	3	1	531	4.4	20	18.6	01	1	3	65	1	2	1	9	5	1	9	6	1	8	bbd
E	9	3	2	531	5.5	46	13.3	05	1													snag
E	9	3	3	531	4.7	52	18.7	01	1	4	50	1	2	1	9	5	1	9	6	1	9	bbd
E	9	3	4	531	5.5	74	18.7	01	1	4	75	1	2	1	9	5	1	9	6	1	9	bbd
E	9	3	5	531	1.7	124	17.5	01	1	3	60	1	2	1	9	5	1	8	6	1	7	bbd
E	9	3	6	531	5.2	142	22.0	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	9	3	7	97	4.1	162	27.0	01	1	3	50	1	0	0	0	0	0	0	0	0	0	
E	9	3	8	531	6.2	170	18.6	01	1	4	45	1	2	1	9	5	1	9	6	1	9	bbd
E	9	3	9	531	3.2	192	22.3	01	1	3	55	1	2	1	9	5	1	9	6	1	7	bbd
E	9	3	10	531	5.3	216	24.0	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	9	3	11	531	5.1	240	26.8	01	1	3	60	1	2	1	9	5	1	9	6	1	9	bbd

(1) fruiting bodies in long open crack wound & again above an old branch wound & decay in canopy old branch wound; (2) 40% wound w/ decay & resin from snag #1 rubbing; (3) one major root decayed from abrasion with downed woody debris; forked 14' up, only 1 leader alive; (4) lots of fruiting bodies; (5) dbh taken above swelling; (6) possible beech; (7) very sick tree

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	9	3	12	531	6.7	256	23.2	05	1													snag, bbd
E	9	3	13	531	7.2	292	13.5	01	1	3	45	1	2	1	9	5	1	9	6	1	8	bbd
E	9	3	14	531	5.3	310	12.9	05	1													snag, bbd
E	9	3	15	531	4.2	316	15.3	01	1	3	70	1	2	1	9	5	1	9	6	1	9	bbd
E	9	3	16	531	2.5	322	13.9	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
E	9	3	17	531	5.3	328	15.2	05	1													snag, bbd
E	9	3	18	531	6.0	338	16.5	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	9	3	19	531	7.0	344	16.2	01	1	3	75	1	2	1	9	5	1	9	6	1	9	bbd
E	9	4	1	531	1.5	2	22.6	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
E	9	4	2	531	7.1	19	17.5	01	1	3	55	1	2	1	9	5	1	9	6	1	7	bbd
E	9	4	3	318	5.6	19	17.7	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
E	9	4	4	531	2.3	24	21.2	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
E	9	4	5	531	4.5	26	20.8	05	1													snag; bbd
E	9	4	6	318	6.4	39	21.7	01	1	3	30	2	2	2	0	0	0	0	0	0	0	(1)
E	9	4	7	318	6.4	40	15.1	01	1	3	45	1	5	2	0	0	0	0	0	0	0	(2)
E	9	4	8	531	2.3	123	18.7	01	1	4	50	1	2	1	9	5	1	9	6	1	7	bbd
E	9	4	9	531	4.7	126	16.2	05	1													snag; bbd
E	9	4	10	531	4.6	154	22.0	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
E	9	4	11	531	2.7	171	22.8	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
E	9	4	12	531	1.5	182	14.7	01	1	3	65	1	2	1	9	5	1	9	6	1	8	bbd
E	9	4	13	531	4.5	188	20.3	01	1	3	50	1	2	1	9	5	1	9	6	1	7	bbd
E	9	4	14	531	6.3	192	16.7	01	1	3	35	1	2	1	9	5	1	9	6	1	6	bbd; (3)
E	9	4	15	97	6.8	214	18.5	05	1													snag; (4)
E	9	4	16	97	4.4	224	16.0	01	1	4	45	1	0	0	0	0	0	0	0	0	0	(5)
E	9	4	17	531	2.4	248	16.3	05	1													snag; bbd
E	9	4	18	97	6.6	264	20.9	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
E	9	4	19	531	3.1	271	17.5	05	1													snag; bbd
E	9	4	20	531	6.2	297	22.5	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd
E	10	1	1	NA	1.9	20	21.8	05	1													snag; (6)
E	10	1	2	371	4.1	22	21.0	01	1	3	60	1	6	2	0	0	0	0	0	0	0	(7)
E	10	1	3	97	5.2	46	13.6	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
E	10	1	4	531	0.9	118	20.6	01	1	3	50	1	2	1	9	5	1	9	6	1	7	bbd
E	10	1	5	316	5.2	144	17.2	01	1	3	50	1	0	0	0	0	0	0	0	0	0	

(1) wound (30-50%) with heart rot to the ground; (2) old branch wound looks very deep (up high); (3) dbh taken above swelling;
(4) top 1/3 of tree broken off & caught in tree #13; (5) forked at 20', only one leader alive; (6) probably beech; (7) large open wound (40%) looks like it's rotting

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	10	1	6	531	1.7	148	19.0	01	1	3	45	1	2	1	9	5	1	9	6	1	8	bbd
E	10	1	7	531	0.6	150	19.0	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	10	1	8	318	5.3	232	14.5	01	1	3	45	1	2	2	0	0	0	0	0	0	0	(1)
E	10	1	9	318	6.1	252	13.6	01	1	3	70	1	2	2	0	0	0	0	0	0	0	(2)
E	10	1	10	318	6.9	266	12.9	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
E	10	1	11	318	5.5	268	13.4	01	1	5	35	1	4	2	0	6	3	5	0	0	0	(3)
E	10	1	12	531	6.7	310	15.2	01	1	3	50	1	2	1	9	5	1	9	6	1	6	bbd
E	10	1	13	318	5.7	338	18.3	01	1	3	65	1	3	3	3	6	2	0	0	0	0	(4)
E	10	2	1	531	4.2	2	22.9	01	5	3	35	1	2	1	9	5	1	9	6	1	8	bbd
E	10	2	2	318	5.9	30	20.1	01	5	3	70	1	0	0	0	0	0	0	0	0	0	
E	10	2	3	318	5.1	31	14.1	01	5	3	20	2	3	2	0	0	0	0	0	0	0	(5)
E	10	2	4	318	2.5	56	19.3	01	5	3	55	1	0	0	0	0	0	0	0	0	0	
E	10	2	5	531	7.2	65	21.7	01	5	3	45	1	2	1	9	5	1	9	6	1	9	bbd
E	10	2	6	318	2.6	74	20.7	01	5	3	55	1	0	0	0	0	0	0	0	0	0	
E	10	2	7	NA	6.7	86	25.5	05	5													snag; (6)
E	10	2	8	316	3.9	102	12.8	01	5	3	45	1	2	2	0	6	3	3	0	0	0	(7)
E	10	2	9	NA	6.8	106	29.2	05	5													snag; (8)
E	10	2	10	316	2.4	128	14.5	01	5	3	65	1	0	0	0	0	0	0	0	0	0	
E	10	2	11	97	7.2	134	24.8	01	5	3	60	1	0	0	0	0	0	0	0	0	0	
E	10	2	12	316	6.2	158	24.0	01	5	3	40	1	0	0	0	0	0	0	0	0	0	
E	10	2	13	316	2.7	164	23.6	01	5	3	65	1	0	0	0	0	0	0	0	0	0	
E	10	2	14	316	5.0	202	13.1	01	5	3	50	1	0	0	0	0	0	0	0	0	0	
E	10	2	15	531	4.5	227	34.5	05	5													snag; bbd
E	10	2	16	531	1.1	264	14.6	01	5	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	10	2	17	97	6.4	298	15.3	01	5	5	50	1	6	2	0	0	0	0	0	0	0	(9)
E	10	2	18	531	7.0	310	14.9	01	5	3	45	1	2	1	9	5	1	9	6	1	8	bbd
E	10	3	1	97	7.3	8	29.7	01	5	3	80	1	0	0	0	0	0	0	0	0	0	
E	10	3	2	316	3.8	34	14.3	01	5	3	50	1	3	2	0	0	0	0	0	0	0	(10)
E	10	3	3	316	3.8	34	19.2	01	5	3	45	1	3	2	0	0	0	0	0	0	0	(10)
E	10	3	4	316	4.5	60	13.9	01	5	4	30	2	6	21	5	0	0	0	0	0	0	(11)
E	10	3	5	316	0.7	92	28.4	01	5	3	40	1	0	0	0	0	0	0	0	0	0	(12)

(1) 20% open wound with decaying wood; (2) several wounds with decay & punky wood; (3) deep hole-old branch wound with decay; (4) horizontal branch wound, hole in crown (50%); broken top; (5) 20% wound w/ fungus fruiting bodies; old branch wound; (6) possible beech; (7) small hole near ground with punky wood, wound in crown; (8) possible beech; (9) leader rubbed by another tree's branch causing wound (40%) & fungus; forked 15' up; (10) trees #2 &3 are forks of one stump 3' up, fruiting bodies (white, hard,wavy, conelike) on a common base; (11) main (& only main) stem broke & is hanging down; (12) old healing lightning strike

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
E	10	3	6	97	3.6	120	33.7	01	5	3	70	1	0	0	0	0	0	0	0	0	0	(1)
E	10	3	7	371	2.7	160	20.4	01	5	3	65	1	0	0	0	0	0	0	0	0	0	
E	10	3	8	371	7.1	190	15.1	01	5	3	40	1	3	2	0	0	0	0	0	0	0	(2)
E	10	3	9	371	7.0	196	14.8	01	5	3	45	1	4	2	0	0	0	0	0	0	0	(3)
E	10	3	10	371	7.2	220	23.1	01	5	3	80	1	3	2	0	0	0	0	0	0	0	(4)
E	10	3	11	935	4.1	230	13.5	01	5	4	50	1	2	2	0	5	2	0	0	0	0	(5)
E	10	3	12	NA	5.2	238	13.7	05	5													snag; (6)
E	10	3	13	935	6.1	330	14.1	01	5	4	55	1	2	2	0	0	0	0	0	0	0	(7)
E	10	4	1	531	4.2	12	18.9	01	1	3	65	1	2	1	9	5	1	9	6	1	9	bbd
E	10	4	2	531	1.7	14	13.1	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
E	10	4	3	97	6.5	16	32.0	01	1	3	70	1	0	0	0	0	0	0	0	0	0	(8)
E	10	4	4	531	7.0	46	15.9	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
E	10	4	5	97	6.3	62	24.0	01	1	3	65	1	0	0	0	0	0	0	0	0	0	
E	10	4	6	97	5.5	78	28.4	01	1	3	65	1	0	0	0	0	0	0	0	0	0	(9)
E	10	4	7	371	7.3	140	26.2	01	1	3	55	1	2	2	0	5	2	0	0	0	0	(10)
E	10	4	8	97	7.0	170	32.3	01	1	3	75	1	0	0	0	0	0	0	0	0	0	(11)
E	10	4	9	318	3.8	222	19.1	01	1	3	45	1	3	2	0	0	0	0	0	0	0	(12)
E	10	4	10	97	3.8	232	24.9	01	1	3	80	1	0	0	0	0	0	0	0	0	0	forked 12' up
E	10	4	11	531	6.8	252	22.0	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
E	10	4	12	97	4.4	318	14.2	01	1	5	50	1	0	0	0	0	0	0	0	0	0	(13)
E	10	4	13	371	5.8	344	20.7	01	1	3	55	1	2	2	0	5	2	0	0	0	0	(14)

(1) wishbone with 5 leaders at 15' up; (2) deep cavity 4" wide x 6" long; (3) 2 old branch wounds with punky wood; (4) big deep hole with visible rot, old branch wound;
(5) deep cavity with punk; old branch wound ripped long way with rot; (6) conifer, probably spruce; (7) holes & decay & fungi mats;
(8) 2 increment bore holes-tree #66 in someone's study; (9) sapling has been absorbed for years now at stump (spruce);
(10) 3" deep cavity w/ decay; huge rotting area extending 4' on bole; (11) 20' old lightning scar healed;
(12) horizontal wound w/ decay 50%, perhaps old branch broken crown from neighbor spruce leaning on it; (13) lost leader at 8' a long time ago;
(14) fruiting bodies on lower area; deep crack

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	1	1	1	318	6.6	36	63.3	01	1	3	50	1	2	2	0	0	0	0	0	0	0	
AY	1	1	2	531	6.9	161	15.0	01	1	5	30	2	2	1	9	5	1	9	6	1	7	bbd
AY	1	1	3	97	4.3	188	58.6	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
AY	1	1	4	531	6.4	220	13.6	05	1													snag, bbd
AY	1	1	5	531	5.3	242	16.3	01	1	5	40	1	2	1	9	5	1	9	6	1	9	bbd
AY	1	1	6	531	6.0	246	13.2	01	1	5	30	2	2	1	9	5	1	9	6	1	9	bbd
AY	1	1	7	531	4.0	322	15.1	01	1	5	50	1	2	1	9	5	1	9	6	1	9	bbd
AY	1	1	8	531	2.4	340	19.6	01	1	4	60	1	2	1	9	5	1	9	6	1	9	bbd
AY	1	2	1	97	3.2	4	13.7	01	1	5	25	2	0	0	0	0	0	0	0	0	0	
AY	1	2	2	371	3.5	21	67.6	01	1	3	65	1	0	0	0	0	0	0	0	0	0	
AY	1	2	3	531	6.6	23	13.6	01	1	5	45	1	2	1	9	5	1	9	6	1	9	bbd, (1)
AY	1	2	4	531	3.9	109	13.5	01	1	5	55	1	2	1	9	5	1	9	6	1	9	bbd; (2)
AY	1	2	5	531	3.9	109	29.4	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd; (3)
AY	1	2	6	531	7.0	150	24.1	01	1	5	25	2	2	1	9	5	1	9	6	1	9	bbd, (4)
AY	1	2	7	531	4.6	224	13.9	01	1	4	55	1	2	1	9	5	1	9	6	1	9	bbd; (5)
AY	1	2	8	97	5.7	357	23.5	01	1	3	50	1	0	0	0	0	0	0	0	0	0	
AY	1	3	1	315	7.1	76	14.0	01	3	4	30	2	2	2	0	0	0	0	0	0	0	
AY	1	3	2	531	5.8	90	37.5	01	3	3	35	1	2	1	9	5	1	9	6	1	9	bbd
AY	1	3	3	97	4.9	125	15.8	01	3	5	40	1	0	0	0	0	0	0	0	0	0	
AY	1	3	4	531	5.1	187	13.8	05	3													snag, bbd
AY	1	3	5	531	1.3	213	44.0	01	3	3	45	1	2	1	9	5	1	9	6	1	9	bbd
AY	1	4	1	315	6.3	82	16.5	01	5	3	20	3	2	2	0	7	22	8	0	0	0	old tree
AY	1	4	2	531	3.5	130	14.0	01	5	3	40	1	2	1	9	5	1	9	6	1	6	bbd
AY	1	4	3	316	4.8	195	17.7	01	5	3	35	1	3	2	0	0	0	0	0	0	0	(6)
AY	1	4	4	316	3.7	195	16.0	01	5	3	30	2	0	0	0	0	0	0	0	0	0	
AY	1	4	5	315	5.3	214	15.0	01	5	3	25	2	3	2	0	0	0	0	0	0	0	(7)
AY	1	4	6	531	5.9	360	30.0	01	5	3	60	1	2	1	9	5	1	9	6	1	9	bbd
AY	2	1	1	371	5.6	20	14.8	01	2	3	35	1	0	0	0	0	0	0	0	0	0	
AY	2	1	2	97	6.0	20	14.4	05	2													snag
AY	2	1	3	97	2.9	40	20.1	01	2	3	35	1	1	2	0	0	0	0	0	0	0	(8)
AY	2	1	4	129	7.2	52	41.5	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY	2	1	5	371	2.5	58	13.0	01	2	5	40	1	2	2	0	0	0	0	0	0	0	(9)
AY	2	1	6	97	5.6	60	15.3	01	2	5	15	2	6	21	3	0	0	0	0	0	0	(10)

(1) tree #2 in way of horizontal distance; (2) forked tree; (3) forked tree; (4) broken off top, one large branch only; (5) dbh taken above knot; (6) old branch wound; (7) conk very high up in lower bole; (8) opening into base of tree at roots; (9) small wound decaying; (10) trapped under white pine

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	2	1	7	371	4.9	86	22.5	01	2	5	40	2	1	2	0	3	2	0	6	22	3	(1)
AY	2	1	8	371	6.6	96	15.3	05	2													snag
AY	2	1	9	97	7.3	162	22.4	01	2	4	40	1	0	0	0	0	0	0	0	0	0	
AY	2	1	10	97	6.6	184	26.0	01	2	3	40	1	0	0	0	0	0	0	0	0	0	(2)
AY	2	1	11	97	6.9	225	13.0	01	2	5	50	1	0	0	0	0	0	0	0	0	0	
AY	2	1	12	371	1.5	230	15.4	01	2	4	35	1	0	0	0	0	0	0	0	0	0	(3)
AY	2	1	13	97	2.4	236	19.2	01	2	3	40	1	0	0	0	0	0	0	0	0	0	(4)
AY	2	1	14	531	3.9	264	23.6	05	2													snag
AY	2	1	15	97	2.7	274	13.9	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	2	1	16	371	5.1	280	17.4	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
AY	2	1	17	97	5.3	284	18.2	01	2	3	35	1	0	0	0	0	0	0	0	0	0	
AY	2	1	18	97	4.0	300	21.4	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	2	1	19	97	6.7	302	17.9	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
AY	2	1	20	371	4.4	345	13.4	01	2	3	30	2	2	2	0	0	0	0	0	0	0	(5)
AY	2	2	1	97	5.7	26	35.1	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
AY	2	2	2	97	4.1	30	28.7	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
AY	2	2	3	97	6.2	33	21.9	01	4	4	35	1	0	0	0	0	0	0	0	0	0	(6)
AY	2	2	4	97	4.6	119	16.4	01	4	5	30	2	3	2	0	6	21	3	0	0	0	(7)
AY	2	2	5	97	3.9	128	35.4	01	4	3	70	1	1	2	0	0	0	0	0	0	0	(8)
AY	2	2	6	97	1.2	154	27.8	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
AY	2	2	7	97	3.3	221	35.6	01	4	3	65	1	0	0	0	0	0	0	0	0	0	
AY	2	2	8	97	2.4	229	15.0	01	4	4	30	2	0	0	0	0	0	0	0	0	0	
AY	2	2	9	97	5.8	237	27.8	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
AY	2	2	10	97	6.1	250	17.8	01	4	5	25	2	1	2	0	0	0	0	0	0	0	(9)
AY	2	2	11	97	4.6	266	28.2	01	4	3	40	1	0	0	0	0	0	0	0	0	0	
AY	2	2	12	97	7.2	275	30.9	01	4	3	70	1	3	2	0	0	0	0	0	0	0	(10)
AY	2	2	13	97	3.3	303	23.3	01	4	3	30	2	3	2	0	0	0	0	0	0	0	(11)
AY	2	2	14	97	4.8	308	32.4	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
AY	2	2	15	97	3.9	315	14.0	01	4	5	15	2	6	21	3	0	0	0	0	0	0	(12)
AY	2	2	16	97	6.2	333	13.5	05	4													snag
AY	2	3	1	97	5.6	54	24.3	01	2	3	45	1	0	0	0	0	0	0	0	0	0	

(1) long narrow crack in bole with decay; decayed root; (2) very unusual bark, platy but with vertical striation; (3) downed bole rubbing 1 1/2' off ground;
(4) same downed bole rubbing 1 1/2' off ground; (5) deep wound & decayed away heart-rot; (6) forked at ≈ 25' & again above there several times;
(7) forked & curved at 20' & 25'; branch wound looks punky; no clear leader yet; (8) rotten in roots; (9) decaying roots; (10) old woodpecker hole at 3';
(11) 3" wound with decay; (12) broken top - lost a couple of leaders

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	2	3	2	97	6.6	82	21.9	01	2	4	25	2	0	0	0	0	0	0	0	0	0	
AY	2	3	3	97	7.1	97	35.1	01	2	3	65	1	1	2	0	0	0	0	0	0	0	(1)
AY	2	3	4	97	2.0	121	29.8	01	2	3	80	1	1	2	0	0	0	0	0	0	0	(2)
AY	2	3	5	97	6.5	221	16.2	01	2	5	75	1	0	0	0	0	0	0	0	0	0	
AY	2	3	6	371	2.2	240	28.6	05	2													snag; (3)
AY	2	3	7	97	7.0	243	21.4	01	2	4	30	2	0	0	0	0	0	0	0	0	0	
AY	2	3	8	97	5.8	250	15.8	01	2	5	30	2	1	2	0	0	0	0	0	0	0	(4)
AY	2	3	9	97	4.2	266	24.4	01	2	4	70	1	2	2	0	0	0	0	0	0	0	(5)
AY	2	3	10	97	1.1	272	20.5	01	2	4	35	1	0	0	0	0	0	0	0	0	0	(6)
AY	2	3	11	97	4.4	281	15.4	01	2	5	35	1	0	0	0	0	0	0	0	0	0	(7)
AY	2	3	12	97	7.1	288	29.9	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
AY	2	3	13	371	3.7	302	56.5	01	2	3	50	1	3	1	5	0	0	0	0	0	0	(8)
AY	2	3	14	97	4.2	309	14.9	01	2	5	30	2	0	0	0	0	0	0	0	0	0	(9)
AY	2	3	15	97	6.5	340	22.1	01	2	4	40	1	0	0	0	0	0	0	0	0	0	
AY	2	3	16	97	7.1	350	21.5	01	2	4	35	1	0	0	0	0	0	0	0	0	0	(10)
AY	2	4	1	371	3.7	8	26.5	05	3													snag
AY	2	4	2	531	5.3	37	16.1	05	3													snag
AY	2	4	3	531	3.9	113	16.0	01	3	5	30	2	2	1	9	5	1	9	6	1	9	bbd
AY	2	4	4	371	4.9	116	55.0	01	3	3	50	1	2	2	0	0	0	0	0	0	0	(11)
AY	2	4	5	531	6.9	116	13.2	05	3													snag; bbd
AY	2	4	6	531	4.2	183	14.5	05	3													snag
AY	2	4	7	371	6.7	208	44.8	01	3	3	40	1	1	2	0	3	2	0	0	0	0	(12)
AY	2	4	8	531	2.7	264	34.3	01	3	3	60	1	2	1	9	5	1	9	6	1	9	bbd
AY	2	4	9	531	5.2	323	21.4	01	3	3	35	1	2	1	9	5	1	9	6	1	9	bbd
AY	2	4	10	531	6.8	352	16.3	01	3	4	70	1	2	1	9	5	1	9	6	1	9	bbd
AY	3	1	1	97	5.3	28	32.6	01	4	3	50	1	0	0	0	0	0	0	0	0	0	
AY	3	1	2	97	4.4	48	17.3	01	4	4	45	1	0	0	0	0	0	0	0	0	0	
AY	3	1	3	97	6.6	52	36.7	01	4	3	40	1	0	0	0	0	0	0	0	0	0	(13)
AY	3	1	4	97	5.7	71	16.5	01	4	4	10	2	3	3	2	0	0	0	0	0	0	(14)
AY	3	1	5	97	3.1	80	35.9	01	4	3	40	1	0	0	0	0	0	0	0	0	0	
AY	3	1	6	97	6.1	84	17.9	01	4	3	35	1	0	0	0	0	0	0	0	0	0	

(1) exposed decaying root; (2) decaying exposed root & on stump; (3) loose bark affecting dbh; (4) wound with punk; (5) open wound, a little decaying on surface;
(6) big bend of new leader 35' up; (7) leader trapped under large yellow birch branch; (8) dbh taken above gall, second gall above;
(9) rubbing leaning snag 8' up; forked at 25' up; (10) forked about 15' up; (11) open wound 6" at ground with decay & insect holes;
(12) decay exposed roots; lg wound from soil 4'; deep hole on backside going way into tree; (13) forked 25' up with 2 live leaders; (14) deep crevice & horizontal slice

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	3	1	7	97	5.5	111	28.5	01	4	3	50	1	0	0	0	0	0	0	0	0	0	
AY	3	1	8	97	0.7	118	14.2	01	4	5	25	2	0	0	0	0	0	0	0	0	0	
AY	3	1	9	97	6.5	143	25.0	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
AY	3	1	10	97	3.3	155	13.5	01	4	4	30	2	0	0	0	0	0	0	0	0	0	
AY	3	1	11	97	4.2	162	29.6	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
AY	3	1	12	97	6.0	190	30.3	01	4	3	65	1	0	0	0	0	0	0	0	0	0	
AY	3	1	13	97	7.2	196	33.5	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
AY	3	1	14	97	3.3	204	27.7	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
AY	3	1	15	97	6.1	226	22.5	01	4	4	35	1	0	0	0	0	0	0	0	0	0	
AY	3	1	16	531	5.8	267	17.3	01	4	3	35	1	2	1	9	5	1	9	6	1	9	bbd
AY	3	1	17	531	7.2	277	17.5	05	4													snag
AY	3	1	18	531	6.6	284	23.4	01	4	3	75	1	0	0	0	0	0	0	0	0	0	healthy beech
AY	3	1	19	97	6.7	320	18.2	01	4	5	35	1	0	0	0	0	0	0	0	0	0	
AY	3	1	20	97	4.1	320	31.2	01	4	3	60	1	0	0	0	0	0	0	0	0	0	(1)
AY	3	2	1	97	2.3	24	18.4	01	6	3	40	1	0	0	0	0	0	0	0	0	0	
AY	3	2	2	97	6.7	24	20.8	01	6	4	30	2	1	2	0	0	0	0	0	0	0	(2)
AY	3	2	3	97	3.2	37	14.2	01	6	3	45	1	0	0	0	0	0	0	0	0	0	
AY	3	2	4	97	5.2	50	26.1	01	6	3	45	1	0	0	0	0	0	0	0	0	0	(3)
AY	3	2	5	833	6.3	62	17.8	01	6	3	40	1	0	0	0	0	0	0	0	0	0	great oak!
AY	3	2	6	12	5.0	104	24.2	05	6													snag
AY	3	2	7	12	4.8	109	18.8	01	6	3	40	1	0	0	0	0	0	0	0	0	0	
AY	3	2	8	97	7.2	121	16.6	01	6	3	40	1	0	0	0	0	0	0	0	0	0	
AY	3	2	9	97	1.3	130	23.3	01	6	3	40	1	0	0	0	0	0	0	0	0	0	
AY	3	2	10	12	5.4	146	15.8	01	6	3	30	2	0	0	0	0	0	0	0	0	0	
AY	3	2	11	97	2.1	150	19.5	01	6	3	50	1	0	0	0	0	0	0	0	0	0	(4)
AY	3	2	12	12	6.6	158	18.1	01	6	3	30	2	0	0	0	0	0	0	0	0	0	
AY	3	2	13	12	6.3	160	13.7	01	6	4	25	2	0	0	0	0	0	0	0	0	0	(5)
AY	3	2	14	97	2.6	163	13.5	01	6	4	45	1	0	0	0	0	0	0	0	0	0	
AY	3	2	15	97	6.3	202	15.7	01	6	3	40	1	0	0	0	0	0	0	0	0	0	leaning
AY	3	2	16	12	7.0	206	17.1	01	6	3	35	1	0	0	0	0	0	0	0	0	0	
AY	3	2	17	97	4.4	210	13.3	01	6	4	30	2	6	22	2	0	0	0	0	0	0	(6)
AY	3	2	18	97	6.1	214	13.4	01	6	4	40	1	0	0	0	0	0	0	0	0	0	
AY	3	2	19	97	3.9	222	14.8	01	6	3	30	2	0	0	0	0	0	0	0	0	0	

(1) tree 20 in the way of accurate horizontal distance; (2) exposed root-decaying 20%; big bend of old fork; (3) healing wound at base; (4) several lightning scars healed; (5) 10' old lightning scar healed; (6) 10' up absorbing old dead leader; small canopy with dead branches

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	3	2	20	97	4.3	235	19.1	01	6	3	40	1	5	2	0	0	0	0	0	0	0	(1)
AY	3	2	21	12	3.9	245	19.0	01	6	3	30	2	0	0	0	0	0	0	0	0	0	(2)
AY	3	2	22	97	4.4	272	15.3	01	6	3	40	1	0	0	0	0	0	0	0	0	0	
AY	3	2	23	97	3.1	282	15.8	01	6	3	35	1	0	0	0	0	0	0	0	0	0	
AY	3	2	24	12	6.4	286	15.8	01	6	5	15	3	2	2	0	5	2	0	6	21	8	(3)
AY	3	2	25	12	4.3	306	16.5	01	6	3	35	1	2	2	0	0	0	0	0	0	0	(4)
AY	3	2	26	12	2.2	335	17.7	05	6													snag; (5)
AY	3	2	27	97	4.0	346	31.6	01	6	3	50	1	0	0	0	0	0	0	0	0	0	(6)
AY	3	2	28	12	6.1	355	14.6	05	6													snag
AY	3	2	29	97	5.5	357	23.5	01	6	3	55	1	0	0	0	0	0	0	0	0	0	
AY	3	3	1	12	6.1	13	15.6	01	6	3	45	1	2	2	0	5	2	0	0	0	0	(7)
AY	3	3	2	12	6.3	56	17.8	05	6													snag
AY	3	3	3	97	4.9	83	23.9	01	6	3	50	1	0	0	0	0	0	0	0	0	0	(8)
AY	3	3	4	12	2.1	90	18.8	01	6	3	35	1	0	0	0	0	0	0	0	0	0	(9)
AY	3	3	5	97	3.5	98	15.4	01	6	3	50	1	0	0	0	0	0	0	0	0	0	(10)
AY	3	3	6	97	3.5	98	16.3	01	6	3	45	1	0	0	0	0	0	0	0	0	0	(10)
AY	3	3	7	NA	7.2	122	16.4	05	6													snag
AY	3	3	8	97	6.7	142	20.4	01	6	3	45	1	0	0	0	0	0	0	0	0	0	
AY	3	3	9	97	4.8	146	23.8	01	6	3	50	1	0	0	0	0	0	0	0	0	0	
AY	3	3	10	97	5.4	171	15.5	01	6	5	45	1	0	0	0	0	0	0	0	0	0	
AY	3	3	11	97	4.4	176	21.4	01	6	3	45	1	0	0	0	0	0	0	0	0	0	
AY	3	3	12	97	2.1	199	24.1	01	6	3	50	1	0	0	0	0	0	0	0	0	0	(11)
AY	3	3	13	97	6.7	214	30.0	01	6	3	60	1	0	0	0	0	0	0	0	0	0	
AY	3	3	14	97	6.9	236	24.6	01	6	3	55	1	0	0	0	0	0	0	0	0	0	(12)
AY	3	3	15	97	6.2	247	15.5	01	6	3	45	1	0	0	0	0	0	0	0	0	0	
AY	3	3	16	12	3.8	290	12.9	05	6													snag
AY	3	3	17	12	4.6	308	18.5	05	6													snag
AY	3	3	18	12	5.3	320	17.3	05	6													snag
AY	3	3	19	97	6.2	334	19.8	01	6	3	55	1	0	0	0	0	0	0	0	0	0	
AY	3	3	20	NA	7.2	334	14.3	05	6													snag
AY	3	3	21	97	0.9	340	22.0	01	6	3	40	1	0	0	0	0	0	0	0	0	0	

(1) big wound 50% with decay & lots of resin; (2) 6' long X 6' wide lightning scar healing; (3) many wounds with decay & fruiting bodies; tiny crown & lots of dead; (4) 20% decaying 5' long section; (5) broke below dbh but still "standing" above the break (leaning on trees above); (6) 15-20' healing lightning scar with resin; (7) vertical wound with decay in several locations; forked 18' up - 2 leaders; (8) trees 3 - 8 have bundle of dead trees in the way of horizontal distance measurements; (9) crooked in a couple places; (10) tree 5 & 6 grew together at the stump; (11) crooked in one spot; (12) 8' healed lightning scar; 15' up absorbed very old leader

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	3	3	22	97	1.7	342	13.7	01	6	4	50	1	0	0	0	0	0	0	0	0	0	
AY	3	3	23	NA	6.2	348	15.2	05	6													snag
AY	3	4	1	12	5.9	7	23.7	01	6	4	45	2	1	11	0	6	2	2	0	0	0	(1)
AY	3	4	2	97	2.3	27	22.1	01	6	3	45	1	0	0	0	0	0	0	0	0	0	
AY	3	4	3	97	3.7	52	12.9	01	6	4	35	1	0	0	0	0	0	0	0	0	0	
AY	3	4	4	97	4.7	74	12.9	01	6	5	55	1	0	0	0	0	0	0	0	0	0	
AY	3	4	5	12	3.2	80	20.0	05	6													snag
AY	3	4	6	97	6.4	102	13.1	01	6	5	60	1	0	0	0	0	0	0	0	0	0	
AY	3	4	7	97	1.7	107	33.6	01	6	3	70	1	0	0	0	0	0	0	0	0	0	(2)
AY	3	4	8	NA	4.1	114	18.0	05	6													snag
AY	3	4	9	97	4.5	197	15.8	01	6	4	50	1	0	0	0	0	0	0	0	0	0	
AY	3	4	10	12	4.1	215	15.5	01	6	3	25	2	0	0	0	0	0	0	0	0	0	
AY	3	4	11	97	5.7	241	36.1	01	6	3	65	1	3	4	3	0	0	0	0	0	0	(3)
AY	3	4	12	97	6.2	251	18.7	01	6	5	35	1	0	0	0	0	0	0	0	0	0	new leader
AY	3	4	13	97	6.1	261	13.6	01	6	5	40	1	0	0	0	0	0	0	0	0	0	
AY	3	4	14	12	3.8	272	22.4	05	6													snag
AY	3	4	15	97	6.0	280	17.7	01	6	3	40	1	0	0	0	0	0	0	0	0	0	
AY	3	4	16	371	6.2	284	20.5	01	6	4	35	1	2	2	0	0	0	0	0	0	0	(4)
AY	3	4	17	97	7.2	292	21.4	01	6	3	35	1	0	0	0	0	0	0	0	0	0	
AY	3	4	18	97	5.2	300	23.6	01	6	3	55	1	0	0	0	0	0	0	0	0	0	
AY	3	4	19	97	6.9	332	13.3	01	6	5	35	1	0	0	0	0	0	0	0	0	0	(5)
AY	3	4	20	97	3.9	335	21.6	01	6	3	50	1	0	0	0	0	0	0	0	0	0	
AY	3	4	21	97	4.4	339	15.1	01	6	4	45	1	0	0	0	0	0	0	0	0	0	
AY	3	4	22	97	6.7	357	18.3	01	6	3	40	1	0	0	0	0	0	0	0	0	0	(6)
AY	4	1	1	97	6.3	60	21.0	01	6	3	70	1	0	0	0	0	0	0	0	0	0	
AY	4	1	2	935	4.4	88	13.0	01	6	3	45	1	2	2	0	0	0	0	0	0	0	(7)
AY	4	1	3	12	1.5	130	14.7	01	6	3	50	1	0	0	0	0	0	0	0	0	0	
AY	4	1	4	97	5.9	134	27.3	01	6	3	40	1	0	0	0	0	0	0	0	0	0	(8)
AY	4	1	5	97	4.9	150	18.3	01	6	3	45	1	0	0	0	0	0	0	0	0	0	
AY	4	1	6	97	7.2	152	17.7	01	6	3	55	1	0	0	0	0	0	0	0	0	0	
AY	4	1	7	371	5.6	181	15.8	05	6													snag
AY	4	1	8	97	2.5	190	26.0	01	6	3	60	1	0	0	0	0	0	0	0	0	0	

(1) uprooted and leaning ≈60º angle; dead branches & foliage discoloration; (2) forked 18" up - 2 leaders; (3) several branch attachments with resinosis where bole is swollen; (4) several wounds with decay; dbh taken above knots; (5) forked 25' up - 2 leaders; (6) roots slightly lifted on one side from tree #1 tip up;
(7) 18" wound with rot; (8) forked at 6'- 2 leaders

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	4	1	9	97	6.3	192	26.7	01	6	3	65	1	0	0	0	0	0	0	0	0	0	(1)
AY	4	1	10	97	3.9	254	30.0	01	6	3	65	1	0	0	0	0	0	0	0	0	0	
AY	4	1	11	371	6.0	268	18.5	01	6	3	55	1	0	0	0	0	0	0	0	0	0	(2)
AY	4	1	12	97	4.8	282	34.1	01	6	3	65	1	0	0	0	0	0	0	0	0	0	
AY	4	1	13	97	5.3	313	12.9	01	6	3	30	2	0	0	0	0	0	0	0	0	0	
AY	4	1	14	97	2.8	332	26.3	01	6	3	60	1	0	0	0	0	0	0	0	0	0	(3)
AY	4	2	1	97	3.2	38	36.4	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
AY	4	2	2	97	4.3	70	13.6	01	2	3	25	2	0	0	0	0	0	0	0	0	0	
AY	4	2	3	97	7.0	70	25.6	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
AY	4	2	4	97	3.6	104	22.5	01	2	3	35	1	0	0	0	0	0	0	0	0	0	(4)
AY	4	2	5	97	6.8	128	29.3	01	2	3	40	1	1	2	0	3	2	0	0	0	0	(5)
AY	4	2	6	97	3.8	129	27.8	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
AY	4	2	7	371	4.9	140	31.1	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	4	2	8	97	4.6	158	13.5	01	2	5	35	1	0	0	0	0	0	0	0	0	0	
AY	4	2	9	371	5.8	216	13.2	01	2	3	75	1	3	2	0	0	0	0	0	0	0	(6)
AY	4	2	10	97	1.8	233	22.6	01	2	3	50	1	0	0	0	0	0	0	0	0	0	(7)
AY	4	2	11	97	1.8	233	27.6	01	2	3	55	1	0	0	0	0	0	0	0	0	0	(8)
AY	4	2	12	97	6.0	262	22.8	01	2	3	70	1	2	2	0	0	0	0	0	0	0	(9)
AY	4	2	13	97	3.1	308	34.5	01	2	3	60	1	0	0	0	0	0	0	0	0	0	(10)
AY	4	2	14	97	3.7	320	13.4	01	2	5	20	2	0	0	0	0	0	0	0	0	0	
AY	4	2	15	97	2.7	332	26.1	01	2	3	55	1	0	0	0	0	0	0	0	0	0	(11)
AY	4	2	16	97	6.3	338	18.5	01	2	3	35	1	0	0	0	0	0	0	0	0	0	
AY	4	3	1	97	4.8	17	18.7	01	2	3	100	1	0	0	0	0	0	0	0	0	0	(12)
AY	4	3	2	97	6.4	24	21.6	01	2	3	100	1	0	0	0	0	0	0	0	0	0	(13)
AY	4	3	3	97	7.2	30	27.5	01	2	3	100	1	0	0	0	0	0	0	0	0	0	(14)
AY	4	3	4	97	7.3	181	25.0	01	2	3	95	1	0	0	0	0	0	0	0	0	0	(15)
AY	4	3	5	97	3.2	247	20.5	01	2	3	100	1	0	0	0	0	0	0	0	0	0	
AY	4	3	6	97	4.1	252	25.5	01	2	3	65	1	0	0	0	0	0	0	0	0	0	(16)
AY	4	3	7	97	4.1	252	20.8	01	2	3	60	1	0	0	0	0	0	0	0	0	0	(16)

(1) forked 8' long ago & absorbing leader; (2) absorbing adjacent yellow birch sapling snag; (3) forked 9' up - 2 leaders; (4) very old fork at 12' being absorbed; (5) 23 woodpecker holes in roots & stump; 8 holes in lower bole with decay & lots of resin; (6) dbh taken above fork; old branch wound with decay; (7) dbh taken above swelling; tree 11&12 growing together at base; (8) tree 11&12 growing together at base; (9) 3' wound to the ground & deep with decay; curved at 14' from lost leader long ago; (10) 18' healed lightning scar; (11) forked 15' - 2 leaders; (12) absorbing spruce sapling snag into base; crown laying on ground; (13) crown laying on ground; (14) healing lightning scar 10' long, resinosis; crown grounded; (15) lost leader 8' up long ago & absorbing old one; (16) Tree #6 & 7 growing together at stump

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	4	3	8	97	6.1	310	21.5	01	2	3	85	1	0	0	0	0	0	0	0	0	0	
AY	4	3	9	371	4.0	320	20.5	01	2	3	55	1	2	2	0	5	2	0	0	0	0	(1)
AY	4	3	10	371	4.0	320	18.6	01	2	3	65	1	1	3	2	0	0	0	0	0	0	(2)
AY	4	3	11	371	4.0	320	16.5	01	2	3	60	1	1	3	2	0	0	0	0	0	0	(3)
AY	4	3	12	97	4.8	344	27.1	01	2	3	75	1	0	0	0	0	0	0	0	0	0	
AY	4	4	1	97	6.5	5	19.6	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
AY	4	4	2	97	5.9	34	29.6	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	4	4	3	97	2.2	54	21.5	01	2	3	65	1	0	0	0	0	0	0	0	0	0	(4)
AY	4	4	4	371	4.5	117	16.9	01	2	4	70	1	0	0	0	0	0	0	0	0	0	(5)
AY	4	4	5	97	3.2	141	31.1	01	2	3	60	1	0	0	0	0	0	0	0	0	0	(6)
AY	4	4	6	97	3.8	158	32.7	01	2	3	60	1	0	0	0	0	0	0	0	0	0	(7)
AY	4	4	7	97	6.6	160	18.7	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	4	4	8	371	6.1	218	13.9	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY	4	4	9	371	5.1	224	14.1	05	2													snag
AY	4	4	10	935	5.9	240	18.9	01	2	3	50	1	1	2	0	0	0	0	0	0	0	(8)
AY	4	4	11	97	2.0	264	29.5	01	2	3	55	1	2	2	0	5	2	0	0		0	0	(9)
AY	4	4	12	97	6.7	347	20.7	01	2	3	75	1	0	0	0	0	0	0	0	0	0	
AY	5	1	1	531	2.8	26	14.4	01	1	5	55	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	1	2	531	6.9	32	28.0	01	1	4	45	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	1	3	531	6.1	66	26.0	01	1	3	30	2	2	1	9	5	1	9	6	1	6	bbd
AY	5	1	4	531	3.6	72	15.1	01	1	5	60	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	1	5	531	6.8	88	13.5	01	1	5	35	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	1	6	531	4.2	106	24.5	01	1	3	30	2	2	1	9	5	1	9	6	1	3	bbd
AY	5	1	7	531	5.5	196	19.3	01	1	5	60	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	1	8	531	3.4	212	18.1	01	1	3	60	1	2	1	9	5	1	9	6	1	8	bbd
AY	5	1	9	531	6.9	224	18.3	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
AY	5	1	10	97	5.4	228	17.0	01	1	3	35	1	0	0	0	0	0	0	0	0	0	
AY	5	1	11	531	5.8	234	18.6	01	1	3	45	1	2	1	9	5	1	8	6	1	7	bbd
AY	5	1	12	531	3.7	252	18.9	05	1													snag; bbd
AY	5	1	13	531	6.6	260	19.0	05	1													snag; bbd
AY	5	1	14	531	5.2	302	13.2	01	1	4	55	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	1	15	531	6.7	322	22.0	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd

(1) 1/2 tree is decayed, heart gone, only 50% live bark; (2) dbh taken above fork and knot; (3) open wound on root; same tree as #10 forked well below dbh;
(4) forked 20' up - 2 live leaders; (5) 2 old branch wounds appear to be healing (15%); (6) healed lightning scar 3'; (7) healed lightning scar 9';
(8) caviety reaches from below ground up into root and bole; (9) open wound (20%) with decaying wood! 15' long

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	5	1	16	NA	5.6	356	35.7	05	1													snag
AY	5	2	1	315	0.7	8	13.8	05	3													snag
AY	5	2	2	531	7.3	60	31.3	01	3	3	40	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	2	3	97	6.4	72	25.4	01	3	3	35	1	0	0	0	0	0	0	0	0	0	
AY	5	2	4	318	4.2	140	50.1	01	3	3	55	1	2	2	0	0	0	0	0	0	0	(1)
AY	5	2	5	531	7.2	182	35.9	01	3	3	65	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	2	6	531	6.2	258	23.2	01	3	3	55	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	2	7	531	5.6	304	17.2	01	3	5	25	2	2	1	9	5	1	9	6	1	9	bbd; (2)
AY	5	2	8	531	5.4	334	13.0	01	3	4	75	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	1	97	5.1	18	18.6	01	1	3	40	1	0	0	0	0	0	0	0	0	0	
AY	5	3	2	531	2.9	48	15.8	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	3	531	7.1	66	15.9	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	4	531	4.8	74	15.5	01	1	3	35	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	5	531	5.8	78	17.6	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	6	531	3.7	86	20.6	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	7	531	6.6	98	15.6	01	1	3	40	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	8	315	2.2	116	14.3	05	1													snag
AY	5	3	9	531	6.5	120	16.8	01	1	3	45	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	10	318	0.5	126	14.1	01	1	3	65	1	0	0	0	0	0	0	0	0	0	
AY	5	3	11	531	4.6	204	17.8	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	12	531	4.6	204	15.7	01	1	3	25	2	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	13	531	5.0	290	24.0	01	1	4	70	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	3	14	531	6.2	320	20.1	01	1	3	85	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	4	1	318	5.0	46	46.5	01	1	3	45	1	2	2	0	5	1	6	6	3	3	(3)
AY	5	4	2	531	6.9	46	13.0	01	1	4	65	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	4	3	531	6.0	60	18.2	01	1	5	40	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	4	4	531	3.3	110	16.5	05	1													snag; bbd
AY	5	4	5	531	6.1	112	18.5	01	1	4	50	2	2	1	9	5	1	9	6	1	9	bbd
AY	5	4	6	531	6.5	124	24.1	01	1	3	60	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	4	7	531	6.1	128	14.0	05	1													snag; bbd
AY	5	4	8	318	5.5	170	20.1	01	1	3	50	1	0	0	0	0	0	0	0	0	0	
AY	5	4	9	531	2.2	172	19.4	01	1	3	75	1	2	1	9	5	1	9	6	1	9	bbd
AY	5	4	10	318	5.4	178	20.5	01	1	3	50	1	2	2	0	0	0	0	0	0	0	(4)
AY	5	4	11	531	7.2	192	18.0	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd;

(1) fruiting bodies near the base; (2) broken off top; (3) fruiting bodies 1/2 way up tree; gall above; (4) wound with decay; (5) dbh measured above swell

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	5	4	12	318	7.0	198	17.4	01	1	3	50	1	2	2	0	0	0	0	0	0	0	(1)
AY	5	4	13	318	4.7	278	13.4	01	1	3	45	1	2	2	0	0	0	0	0	0	0	(2)
AY	5	4	14	318	3.0	278	18.0	01	1	3	50	1	2	2	0	0	0	0	0	0	0	(3)
AY	5	4	15	NA	3.0	290	14.2	05	1													snag
AY	5	4	16	318	5.2	292	17.9	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
AY	5	4	17	531	2.1	330	22.4	05	1													snag; bbd
AY	6	1	1	531	3.8	22	18.6	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
AY	6	1	2	531	5.6	104	21.3	01	1	3	30	2	2	1	9	5	1	8	6	1	4	bbd
AY	6	1	3	531	4.3	111	13.6	01	1	4	45	1	2	1	9	5	1	4	6	1	3	bbd; forked
AY	6	1	4	531	2.6	123	17.1	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
AY	6	1	5	531	3.0	149	14.3	01	1	3	25	2	2	1	9	5	1	9	6	1	8	bbd
AY	6	1	6	531	3.0	149	17.4	01	1	3	10	3	2	1	9	5	1	9	6	22	8	bbd
AY	6	1	7	97	6.1	180	16.2	01	1	4	30	2	6	21	6	0	0	0	0	0	0	
AY	6	1	8	531	4.0	226	15.3	01	1	3	40	1	2	1	9	5	1	9	6	1	5	bbd
AY	6	1	9	531	5.5	230	14.9	05	1													snag
AY	6	1	10	531	6.6	241	22.8	01	1	3	35	1	2	1	9	5	1	9	6	1	8	bbd
AY	6	1	11	531	7.0	264	18.0	01	1	3	55	1	2	1	9	5	1	9	6	1	9	bbd
AY	6	1	12	531	1.6	274	19.5	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
AY	6	1	13	531	3.9	284	16.0	01	1	3	15	2	2	1	9	5	1	8	6	1	2	bbd
AY	6	1	14	531	1.9	294	20.7	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd; (4)
AY	6	1	15	531	5.4	340	20.5	01	1	3	50	1	2	1	9	5	1	9	6	1	8	bbd
AY	6	1	16	531	1.5	344	14.2	05	1													snag
AY	6	1	17	531	7.0	360	13.6	01	1	4	45	1	2	1	9	5	1	7	6	1	9	bbd
AY	6	2	1	531	3.9	42	22.5	01	1	3	55	1	2	1	9	5	1	9	6	1	8	bbd
AY	6	2	2	531	3.5	48	16.0	01	1	5	20	2	2	1	9	5	1	9	6	1	8	bbd; (5)
AY	6	2	3	371	5.3	60	39.8	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
AY	6	2	4	531	6.3	75	20.9	01	1	3	40	1	2	1	9	5	1	9	6	1	5	bbd
AY	6	2	5	531	4.3	87	22.6	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
AY	6	2	6	531	2.1	119	20.9	01	1	3	25	2	2	1	9	5	1	9	6	1	7	bbd
AY	6	2	7	97	6.1	158	34.8	01	1	3	60	1	0	0	0	0	0	0	0	0	0	
AY	6	2	8	97	2.0	226	18.5	01	1	3	35	1	0	0	0	0	0	0	0	0	0	(6)
AY	6	2	9	531	5.8	270	14.0	01	1	3	50	1	2	1	9	5	1	9	6	1	9	bbd
AY	6	2	10	531	7.2	280	14.8	05	1													snag

(1) wound to ground 40% around and 1' tall; (2) fruiting bodies; (3) wound & fruiting bodies at ground; (4) approx 5' gap in middle of the canopy; (5) leaning, wounded; (6) approx 4' long narrow lightning scar with resin

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	6	2	11	531	2.5	338	28.6	01	1	3	30	2	2	1	9	5	1	9	6	1	7	bbd
AY	6	2	12	315	7.3	352	16.1	05	1													snag
AY	6	3	1	531	6.7	29	16.6	01	1	4	30	2	2	1	8	5	1	5	6	1	2	bbd; (1)
AY	6	3	2	531	6.8	42	17.0	01	1	3	25	2	2	1	9	5	1	5	6	1	2	bbd
AY	6	3	3	531	2.0	58	21.8	01	1	3	30	2	2	1	9	5	1	9	6	1	9	bbd
AY	6	3	4	315	5.2	70	17.1	01	1	4	25	2	2	2	0	5	2	0	6	22	4	(2)
AY	6	3	5	531	5.3	80	20.3	01	1	3	20	2	2	1	9	5	1	9	6	1	5	bbd
AY	6	3	6	315	7.1	92	16.0	01	1	3	35	1	2	2	0	0	0	0	0	0	0	(3)
AY	6	3	7	531	6.2	121	13.7	01	1	3	30	2	2	1	9	5	1	9	6	1	6	bbd
AY	6	3	8	531	3.1	126	16.3	01	1	3	15	2	2	1	9	5	1	9	6	1	9	bbd
AY	6	3	9	315	7.1	148	13.9	05	1													snag
AY	6	3	10	315	6.9	148	14.0	01	1	4	25	2	2	2	0	0	0	0	0	0	0	(4)
AY	6	3	11	315	4.5	156	17.4	01	1	4	20	2	1	11	0	0	0	0	0	0	0	
AY	6	3	12	318	3.8	190	21.8	01	1	3	45	1	3	2	0	0	0	0	0	0	0	(5)
AY	6	3	13	531	3.7	196	17.7	01	1	3	35	1	2	1	9	5	1	6	6	1	4	bbd
AY	6	3	14	531	7.0	210	12.9	01	1	4	25	2	2	1	9	5	1	6	6	1	2	bbd
AY	6	3	15	531	0.9	226	14.3	05	1													snag
AY	6	3	16	531	7.1	269	21.7	01	1	3	20	2	2	1	9	5	1	9	6	1	3	bbd
AY	6	3	17	315	1.9	294	14.4	05	1													snag
AY	6	3	18	531	4.4	300	13.4	05	1													snag; bbd
AY	6	3	19	315	2.2	306	13.9	05	1													snag
AY	6	3	20	531	7.1	330	23.2	01	1	3	40	1	2	1	9	5	1	2	6	1	2	bbd
AY	6	4	1	318	3.7	95	53.5	01	1	3	55	1	2	2	0	0	0	0	0	0	0	(6)
AY	6	4	2	531	7.1	161	19.9	01	1	3	40	1	2	1	9	5	1	9	6	1	7	bbd
AY	6	4	3	531	6.2	250	14.9	01	1	3	30	2	2	1	9	5	1	8	6	1	4	bbd
AY	6	4	4	371	3.6	318	25.9	01	1	3	35	1	2	2	0	0	0	0	0	0	0	
AY	7	1	1	97	4.7	6	16.9	01	2	3	35	1	0	0	0	0	0	0	0	0	0	
AY	7	1	2	316	6.3	36	13.4	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	7	1	3	97	6.5	60	28.8	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
AY	7	1	4	97	6.8	68	20.1	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
AY	7	1	5	97	3.5	76	16.9	01	2	3	30	2	0	0	0	0	0	0	0	0	0	
AY	7	1	6	97	2.9	92	13.4	01	2	3	35	1	0	0	0	0	0	0	0	0	0	
AY	7	1	7	97	6.2	116	18.1	01	2	3	50	1	0	0	0	0	0	0	0	0	0	

(1) dbh taken above swelling; (2) forked - one almost dead side; (3) open wound, punky inside, fruiting bodies;
(4) another stripe maple (#11) toppled on this one therefore leaning; (5) dbh taken above swelling; (6) large wound (30%) reaches ground

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	7	1	8	97	5.9	140	17.6	01	2	4	20	2	6	21	2	0	0	0	0	0	0	dead leader
AY	7	1	9	97	1.0	142	17.0	01	2	3	40	1	0	0	0	0	0	0	0	0	0	(1)
AY	7	1	10	97	5.6	144	28.6	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
AY	7	1	11	97	5.3	164	20.4	01	2	3	45	1	0	0	0	0	0	0	0	0	0	(2)
AY	7	1	12	97	4.8	174	21.2	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
AY	7	1	13	97	2.4	204	17.7	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
AY	7	1	14	97	4.8	215	27.1	01	2	3	35	1	0	0	0	0	0	0	0	0	0	(3)
AY	7	1	15	97	6.1	226	25.6	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
AY	7	1	16	97	4.1	232	14.1	01	2	3	25	2	0	0	0	0	0	0	0	0	0	
AY	7	1	17	97	5.4	274	17.8	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	7	1	18	97	2.9	348	38.5	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY	7	1	19	316	6.4	350	15.8	01	2	3	35	1	0	0	0	0	0	0	0	0	0	
AY	7	2	1	97	7.0	9	18.1	01	2	4	25	2	6	21	2	0	0	0	0	0	0	
AY	7	2	2	97	2.4	46	43.4	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
AY	7	2	3	315	4.2	134	13.0	01	2	3	25	2	3	3	4	7	22	3	0	0	0	bark split
AY	7	2	4	531	7.3	148	32.5	01	2	3	25	1	2	1	9	5	1	9	6	1	9	bbd
AY	7	2	5	531	5.8	190	43.6	01	2	3	35	3	2	1	9	5	1	9	6	1	9	bbd, (4)
AY	7	2	6	97	5.3	244	13.9	01	2	5	60	2	0	0	0	0	0	0	0	0	0	
AY	7	2	7	97	6.3	249	16.5	01	2	4	65	1	0	0	0	0	0	0	0	0	0	
AY	7	2	8	315	3.4	280	17.3	01	2	3	45	1	2	2	0	0	0	0	0	0	0	(5)
AY	7	2	9	97	5.1	304	14.4	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
AY	7	2	10	97	1.3	307	37.0	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	7	3	1	97	1.0	5	47.8	01	5	2	65	1	0	0	0	0	0	0	0	0	0	
AY	7	3	2	97	6.7	16	17.3	05	5													snag, (6)
AY	7	3	3	531	6.5	41	15.4	05	5													snag
AY	7	3	4	531	2.3	78	14.7	05	5													snag
AY	7	3	5	531	6.0	88	17.3	01	5	3	15	2	2	1	9	5	1	9	6	1	4	bbd; split
AY	7	3	6	531	7.0	93	12.8	01	5	3	15	2	2	1	9	5	1	9	6	1	2	bbd
AY	7	3	7	531	5.8	106	13.8	01	5	3	15	3	2	1	9	5	1	9	7	22	3	bbd, (7)
AY	7	3	8	316	7.0	260	16.2	01	5	3	30	2	2	2	0	0	0	0	0	0	0	(8)
AY	7	3	9	316	6.4	270	18.7	01	5	3	40	1	0	0	0	0	0	0	0	0	0	(9)
AY	7	3	10	97	5.4	292	20.3	01	5	4	65	1	0	0	0	0	0	0	0	0	0	

(1) growing around an adjacent sapling, already assimulated into bark; (2) 2 leaders for 2/3 of tree; (3) 2 leaders for 3/4 of tree; (4) lots of dead crown horizontal distance measurement; (5) tree #10 in way of horizontal distance measurement; (6) broken off below crown; (7) crown is lots at bottom then 18' gap and little at top; (8) dbh taken above knot; (9) dead spruce leaning on it

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	7	3	11	531	4.8	320	16.9	01	5	4	30	2	2	1	9	5	1	9	6	1	9	bbd; (1)
AY	7	3	12	316	5.7	324	44.3	01	5	3	45	1	2	2	0	0	0	0	0	0	0	
AY	7	3	13	97	6.8	354	14.3	01	5	5	25	2	0	0	0	0	0	0	0	0	0	
AY	7	4	1	316	4.0	46	44.1	01	2	3	50	1	3	2	0	0	0	0	0	0	0	(2)
AY	7	4	2	97	6.3	49	15.0	01	2	5	75	1	0	0	0	0	0	0	0	0	0	
AY	7	4	3	531	5.4	58	17.4	01	2	5	80	1	2	1	9	5	1	9	6	1	9	bbd
AY	7	4	4	97	5.8	180	12.9	01	2	5	90	1	0	0	0	0	0	0	0	0	0	(3)
AY	7	4	5	NA	3.4	220	14.4	05	2													snag
AY	7	4	6	97	4.7	230	26.7	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
AY	7	4	7	97	5.8	247	19.0	01	2	3	45	1	0	0	0	0	0	0	0	0	0	(4)
AY	7	4	8	97	6.1	254	17.0	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
AY	7	4	9	531	0.8	261	15.3	05	2													snag
AY	7	4	10	97	5.5	284	23.2	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	7	4	11	371	6.2	320	36.0	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	8	1	1	97	6.9	2	12.7	01	2	5	99	1	0	0	0	0	0	0	0	0	0	
AY	8	1	2	97	5.8	78	39.9	01	2	3	55	1	0	0	0	0	0	0	0	0	0	big tree
AY	8	1	3	97	1.4	114	27.0	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
AY	8	1	4	97	6.0	124	43.6	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
AY	8	1	5	97	6.9	176	32.7	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY	8	1	6	316	3.6	198	21.3	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	8	1	7	316	3.6	198	40.0	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	8	1	8	316	3.6	198	17.1	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY	8	1	9	97	6.4	234	17.3	01	2	5	25	2	0	0	0	0	0	0	0	0	0	(5)
AY	8	1	10	97	5.5	290	13.6	01	2	4	45	1	0	0	0	0	0	0	0	0	0	
AY	8	1	11	97	2.2	310	21.2	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
AY	8	1	12	97	5.0	326	31.7	01	2	3	70	1	0	0	0	0	0	0	0	0	0	(6)
AY	8	1	13	97	3.4	346	15.9	01	2	4	25	2	5	3	3	0	0	0	0	0	0	(7)
AY	8	2	1	316	6.3	6	15.5	01	5	3	55	1	3	2	0	0	0	0	0	0	0	(8)
AY	8	2	2	316	7.2	70	19.8	01	5	3	40	1	0	0	0	0	0	0	0	0	0	
AY	8	2	3	316	4.7	78	17.5	01	5	3	40	1	2	2	0	0	0	0	0	0	0	(9)
AY	8	2	4	97	4.9	84	17.7	05	5													snag; (10)
AY	8	2	5	316	5.4	88	25.7	01	5	3	40	1	0	0	0	0	0	0	0	0	0	

(1) tree #1 in way of horizontal distance measurement; (2) lots of sprouting on lower base, above knot region; (3) very red bark, looks a little odd; open growing; (4) 2 leaders, uneven height, starts 1/2 way up tree; (5) forked 14' up with 2 alive and 1 dead leader; (6) looks like fungus mat, very small near base/roots; (7) 3" tall wound covering 30% of tree; (8) deep wound (2-3") from gone branch, punky wood; (9) open wound to ground that's rotting; split stump?; (10) hung up on tree #5

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	8	2	6	97	5.5	102	15.1	01	5	5	70	1	0	0	0	0	0	0	0	0	0	
AY	8	2	7	97	1.9	134	16.5	01	5	4	75	1	0	0	0	0	0	0	0	0	0	(1)
AY	8	2	8	97	4.7	134	18.9	01	5	3	50	1	0	0	0	0	0	0	0	0	0	(2)
AY	8	2	9	97	7.3	184	24.7	01	5	3	45	1	0	0	0	0	0	0	0	0	0	(3)
AY	8	2	10	97	0.6	230	17.7	05	5													snag; (4)
AY	8	2	11	97	5.8	252	28.7	01	5	3	65	1	3	3	2	0	0	0	0	0	0	(5)
AY	8	2	12	97	6.3	270	14.5	01	5	5	65	1	0	0	0	0	0	0	0	0	0	
AY	8	2	13	316	6.7	280	15.1	01	5	3	30	2	3	2	0	0	0	0	0	0	0	(6)
AY	8	2	14	316	3.9	286	12.9	01	5	4	55	1	4	2	0	6	2	0	0	0	0	(7)
AY	8	2	15	316	1.5	352	20.1	01	5	3	35	1	2	2	0	5	2	0	0	0	0	(8)
AY	8	2	16	316	5.2	352	15.1	01	5	3	35	1	0	0	0	0	0	0	0	0	0	
AY	8	2	17	316	1.5	352	14.1	05	5													snag
AY	8	3	1	97	3.1	24	31.2	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
AY	8	3	2	97	6.7	28	17.2	01	4	5	25	2	3	3	2	0	0	0	0	0	0	(9)
AY	8	3	3	97	3.0	62	27.3	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
AY	8	3	4	97	5.3	68	15.8	01	4	4	20	2	0	0	0	0	0	0	0	0	0	
AY	8	3	5	97	1.3	86	14.4	05	4													snag
AY	8	3	6	97	4.9	88	18.0	05	4													snag; (10)
AY	8	3	7	97	6.4	92	34.8	01	4	3	55	1	0	0	0	0	0	0	0	0	0	
AY	8	3	8	97	0.6	102	22.3	01	4	3	40	1	0	0	0	0	0	0	0	0	0	
AY	8	3	9	97	5.3	132	19.7	05	4													snag; (11)
AY	8	3	10	97	3.4	136	16.9	01	4	3	40	1	0	0	0	0	0	0	0	0	0	(12)
AY	8	3	11	97	3.6	150	29.7	05	4													snag; (13)
AY	8	3	12	97	5.3	196	25.2	01	4	3	50	1	0	0	0	0	0	0	0	0	0	
AY	8	3	13	97	5.0	200	24.2	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
AY	8	3	14	97	6.9	230	14.3	05	4													snag; (14)
AY	8	3	15	97	3.2	234	15.3	01	4	4	25	2	2	2	0	6	21	2	0	0	0	(15)
AY	8	3	16	97	5.9	242	18.1	01	4	4	40	1	0	0	0	0	0	0	0	0	0	
AY	8	3	17	97	4.5	242	20.0	01	4	3	35	1	0	0	0	0	0	0	0	0	0	
AY	8	3	18	97	6.6	260	33.5	01	4	3	50	1	0	0	0	0	0	0	0	0	0	(16)

(1) forked at 8' (lost leader) & at 20'; (2) absorbing spruce sapling at the base of tree; (3) 2 leaders 15' up; (4) broke in half (lost leader); (5) 20' up leader ripped & hanging, new leader already; wound on bole; (6) 2-3" deep cavity from lost branch; (7) 4" cavity in long crack; possible frost crack (south side of tree); crown wound from gone branch; (8) connected with snag #18; center of stump is rotting; upper bole wound 30%-very deep; (9) wound 12'up, lost leader at least 3 times, now forked; (10) forked; wounds with worm wiggles; (11) hung up on tree#3, leaning, broke at base; (12) lost leader 15'up a long time ago; (13) broke off 15'up-top hung up on others; (14) small, it died below the upper canopy; (15) cavity at ground with fungus strands; broken top; (16) old small healed lightning scar

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	8	3	19	97	7.0	284	19.2	01	4	3	25	2	5	3	5	0	0	0	0	0	0	(1)
AY	8	3	20	97	3.3	308	33.5	01	4	3	50	1	0	0	0	0	0	0	0	0	0	
AY	8	3	21	97	6.0	338	35.5	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
AY	8	4	1	316	6.8	8	24.1	01	2	3	45	1	2	2	0	0	0	0	0	0	0	(2)
AY	8	4	2	97	6.8	14	28.6	01	2	3	50	1	1	2	0	3	2	0	0	0	0	(3)
AY	8	4	3	97	5.4	48	23.0	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
AY	8	4	4	97	5.3	110	32.6	01	2	3	45	1	0	0	0	0	0	0	0	0	0	(4)
AY	8	4	5	97	6.5	120	14.0	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
AY	8	4	6	833	6.3	130	13.3	01	2	3	30	2	0	0	0	0	0	0	0	0	0	
AY	8	4	7	97	4.4	188	16.0	01	2	5	25	2	3	2	0	0	0	0	0	0	0	(5)
AY	8	4	8	97	4.2	196	26.2	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	8	4	9	316	2.8	202	14.2	01	2	4	40	1	3	3	3	0	0	0	0	0	0	(6)
AY	8	4	10	97	6.4	232	22.3	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
AY	8	4	11	316	1.0	234	17.1	01	2	3	35	1	3	3	3	5	2	0	0	0	0	(7)
AY	8	4	12	97	4.1	256	22.2	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
AY	8	4	13	97	6.0	258	14.5	05	2													snag
AY	8	4	14	97	4.0	258	16.5	01	2	3	35	1	3	3	2	0	0	0	0	0	0	(8)
AY	8	4	15	316	1.6	276	13.9	01	2	4	30	2	2	2	0	5	2	0	0	0	0	(9)
AY	8	4	16	97	6.1	286	19.5	01	2	3	55	1	0	0	0	0	0	0	0	0	0	(10)
AY	8	4	17	97	7.0	292	17.0	01	2	5	50	1	0	0	0	0	0	0	0	0	0	
AY	8	4	18	316	3.3	294	21.4	01	2	3	40	1	2	2	0	5	2	0	0	0	0	(11)
AY	8	4	19	97	5.7	296	21.6	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY	8	4	20	97	1.4	320	16.7	01	2	5	70	1	2	3	4	0	0	0	0	0	0	(12)
AY	8	4	21	316	3.9	350	26.1	01	2	3	40	1	3	2	0	0	0	0	0	0	0	(13)
AY	9	1	1	316	3.1	10	23.5	01	2	3	45	1	2	2	0	0	0	0	0	0	0	(14)
AY	9	1	2	316	3.1	10	24.3	01	2	3	45	1	2	2	0	0	0	0	0	0	0	(15)
AY	9	1	3	531	5.6	60	15.8	01	2	4	50	1	2	1	9	5	1	9	6	1	9	bbd
AY	9	1	4	315	6.4	76	13.1	01	2	4	25	2	2	2	0	0	0	0	0	0	0	(16)
AY	9	1	5	315	3.0	130	15.4	05	2													snag
AY	9	1	6	97	4.8	172	16.0	01	2	4	50	1	0	0	0	0	0	0	0	0	0	

(1) 10' w/ bark stripped off (up to 50% in upper bole); (2) 5" tall wound near ground with rot inside; (3) 20 holes from woodpecker in roots & bole;
(4) old healed lightning scars; (5) 12" wound with decayed wood & insect holes; (6) branch stump creating 6" wound below 'hole' with insect holes in branch;
(7) couple long wounds within 3' space; 2x3" hole above-looks very deep; (8) wound, healing over ok; (9) wounds, rot, conks, & mushrooms going up; (10) lost original leader at 10' long time ago; (11) several long wounds with decaying wood inside; (12) 7 fresh woodpecker holes; (13) old branch wound deep with decaying branch residue;
(14) trees #1 & 2 connected at base with wound and rot; (15) wound down to the ground in the middle; (16) 3' wound to ground with rot; long slits(too narrow)

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY	9	1	7	97	5.9	176	32.0	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
AY	9	1	8	371	6.6	224	15.1	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
AY	9	1	9	531	5.1	246	17.2	01	2	3	35	1	2	1	9	5	1	9	6	1	9	bbd
AY	9	1	10	97	6.3	284	28.2	01	2	3	65	1	0	0	0	0	0	0	0	0	0	forked 25' up
AY	9	1	11	97	5.6	286	17.2	01	2	5	40	1	0	0	0	0	0	0	0	0	0	(1)
AY	9	1	12	97	3.7	304	23.2	01	2	3	50	1	0	0	0	0	0	0	0	0	0	
AY	9	1	13	97	4.8	320	17.3	01	2	4	40	1	0	0	0	0	0	0	0	0	0	
AY	9	1	14	97	7.2	338	14.8	01	2	5	80	1	0	0	0	0	0	0	0	0	0	
AY	9	2	1	531	2.6	50	12.8	01	1	5	30	2	2	1	9	5	1	9	6	1	9	bbd
AY	9	2	2	316	1.2	74	30.1	01	1	3	40	1	3	2	0	0	0	0	0	0	0	(2)
AY	9	2	3	318	4.8	80	41.9	01	1	3	45	1	3	3	5	0	0	0	0	0	0	(3)
AY	9	2	4	316	5.7	90	28.2	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
AY	9	2	5	316	5.2	108	36.1	01	1	3	60	1	0	0	0	0	0	0	0	0	0	(4)
AY	9	2	6	371	1.2	118	19.9	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
AY	9	2	7	531	6.5	186	15.0	01	1	3	30	2	2	1	9	5	1	9	6	1	7	bbd
AY	9	2	8	315	6.3	196	12.9	05	1													snag
AY	9	2	9	531	7.3	202	13.5	01	1	3	35	1	2	1	9	5	1	9	6	1	8	bbd
AY	9	2	10	318	3.9	270	19.7	01	1	3	45	1	0	0	0	0	0	0	0	0	0	
AY	9	2	11	318	3.8	280	13.4	01	1	3	55	1	2	2	0	0	0	0	0	0	0	(5)
AY	9	2	12	318	1.2	290	18.0	01	1	3	40	1	2	2	0	0	0	0	0	0	0	(6)
AY	9	2	13	97	5.3	294	15.8	05	1													snag, (7)
AY	9	2	14	318	0.9	302	14.5	01	1	3	60	1	2	2	0	0	0	0	0	0	0	(8)
AY	9	2	15	318	0.9	302	22.2	01	1	3	35	1	0	0	0	0	0	0	0	0	0	
AY	9	2	16	318	7.3	322	22.8	01	1	3	50	1	0	0	0	0	0	0	0	0	0	
AY	9	2	17	318	6.9	324	18.5	01	1	3	55	1	2	2	0	0	0	0	0	0	0	(9)
AY	9	3	1	97	3.6	82	29.3	01	7	3	70	1	0	0	0	0	0	0	0	0	0	
AY	9	3	2	97	6.0	82	23.4	01	7	3	55	1	0	0	0	0	0	0	0	0	0	
AY	9	3	3	97	4.6	82	13.8	05	7													snag
AY	9	3	4	97	6.8	100	26.0	01	7	3	50	1	0	0	0	0	0	0	0	0	0	
AY	9	3	5	97	4.1	140	28.7	01	7	3	60	1	2	2	0	0	0	0	0	0	0	(10)
AY	9	3	6	316	6.7	208	36.2	01	7	3	45	1	0	0	0	0	0	0	0	0	0	
AY	9	3	7	97	1.8	210	16.8	01	7	4	70	1	0	0	0	0	0	0	0	0	0	(11)

(1) beech sapling being absorbed at stump level; (2) large hole half way through bole with rot; (3) huge limb broke & ripped off 3' long segment of bark;
(4) dbh measured above fork;absorbed sapling?; (5) fruiting bodies in wound, gold colored goop; (6) small deep hole, old branch wound; (7) broken top 1/2 of tree;
(8) rotting out wound about 15" long; (9) 3' tall wound covering 20% of tree; (10) mushroom at base of tree; (11) leader replaced at top

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #	Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY 9 3	8	316	7.0	216	27.9	01	7	3	45	1	0	0	0	0	0	0	0	0	0	
AY 9 3	9	371	4.7	226	34.9	01	7	3	40	1	2	2	0	0	0	0	0	0	0	(1)
AY 9 3	10	371	5.0	260	14.6	01	7	4	45	1	0	0	0	0	0	0	0	0	0	(2)
AY 9 3	11	316	6.4	324	19.3	01	7	3	50	1	0	0	0	0	0	0	0	0	0	
AY 9 3	12	316	6.4	324	18.0	01	7	3	50	1	3	2	0	0	0	0	0	0	0	(3)
AY 9 4	1	97	2.9	102	23.3	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
AY 9 4	2	97	3.9	102	20.8	01	2	3	55	1	0	0	0	0	0	0	0	0	0	(4)
AY 9 4	3	316	5.7	102	13.7	01	2	3	40	1	0	0	0	0	0	0	0	0	0	(5)
AY 9 4	4	97	6.1	140	19.6	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
AY 9 4	5	97	3.1	144	28.2	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
AY 9 4	6	97	3.5	184	16.5	01	2	5	50	1	0	0	0	0	0	0	0	0	0	
AY 9 4	7	97	2.7	246	20.3	01	2	3	55	1	0	0	0	0	0	0	0	0	0	(6)
AY 9 4	8	97	4.1	250	24.4	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY 9 4	9	97	3.0	260	18.1	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY 9 4	10	371	6.1	304	23.3	05	2													snag
AY 9 4	11	97	3.4	318	23.2	01	2	3	60	1	2	2	0	0	0	0	0	0	0	(7)
AY 9 4	12	97	6.2	350	15.7	01	2	4	55	1	0	0	0	0	0	0	0	0	0	(8)
AY 10 1	1	833	4.8	29	27.0	01	4	4	10	3	9	24	8	0	0	0	0	0	0	(9)
AY 10 1	2	97	4.8	65	18.4	01	4	3	65	1	6	3	2	0	0	0	0	0	0	(10)
AY 10 1	3	371	7.3	102	21.8	05	4													snag; (11)
AY 10 1	4	97	4.0	120	31.5	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
AY 10 1	5	97	4.8	167	26.5	01	4	3	50	1	0	0	0	0	0	0	0	0	0	
AY 10 1	6	97	3.4	245	26.9	01	4	3	60	1	0	0	0	0	0	0	0	0	0	
AY 10 1	7	97	1.8	272	17.4	01	4	3	50	3	0	0	0	0	0	0	0	0	0	
AY 10 1	8	97	4.5	312	33.5	01	4	3	65	1	0	0	0	0	0	0	0	0	0	
AY 10 1	9	97	7.2	336	19.0	01	4	3	40	3	0	0	0	0	0	0	0	0	0	
AY 10 1	10	97	7.3	348	19.6	01	4	3	45	1	0	0	0	0	0	0	0	0	0	
AY 10 1	11	97	3.3	353	19.0	01	4	4	65	1	0	0	0	0	0	0	0	0	0	curve 12' up
AY 10 2	1	371	4.6	66	25.6	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY 10 2	2	371	4.1	126	15.3	01	2	5	55	1	2	2	0	5	2	0	0	0	0	(12)
AY 10 2	3	371	7.0	128	17.5	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
AY 10 2	4	97	3.3	154	31.7	01	2	3	55	1	0	0	0	0	0	0	0	0	0	

(1) decayed wood at lower base of tree; (2) spruce broken and leaning on this tree's crown; (3) old branch wound, deep & white rot mycelial mat; (4) forked in 4 parts at 10' up; (5) old branch wound but no decay; (6) lost leader 10'up long time ago; (7) mushroom/fruiting body at base by root; (8)birch sapling snag growing into stump area; (9) very sick, minimal foliage, possibly dead after this year; (10) deep foot-long wound; (11) forked; (12) 85% of bole is decaying away; decaying wound

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #	Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY 10 2	5	97	5.3	174	26.8	01	2	3	70	1	0	0	0	0	0	0	0	0	0	
AY 10 2	6	97	5.6	210	28.4	01	2	3	75	1	1	2	0	3	2	0	0	0	0	(1)
AY 10 2	7	97	0.4	232	13.6	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
AY 10 2	8	97	3.1	234	19.4	01	2	3	65	1	0	0	0	0	0	0	0	0	0	
AY 10 2	9	97	2.0	240	17.0	01	2	3	45	1	0	0	0	0	0	0	0	0	0	
AY 10 2	10	371	2.7	338	20.3	01	2	4	35	1	2	2	0	0	0	0	0	0	0	(2)
AY 10 3	1	316	1.6	52	22.2	01	5	3	40	1	2	2	0	0	0	0	0	0	0	(3)
AY 10 3	2	316	1.6	52	35.0	01	5	3	50	1	2	2	0	5	2	0	0	0	0	(4)
AY 10 3	3	316	1.6	52	23.0	01	5	3	40	1	0	0	0	0	0	0	0	0	0	
AY 10 3	4	97	5.7	76	32.6	01	5	3	80	1	0	0	0	0	0	0	0	0	0	
AY 10 3	5	371	5.7	110	31.7	01	5	3	50	1	0	0	0	0	0	0	0	0	0	
AY 10 3	6	371	5.9	116	15.1	01	5	3	45	1	0	0	0	0	0	0	0	0	0	
AY 10 3	7	371	6.2	120	14.8	01	5	3	50	1	0	0	0	0	0	0	0	0	0	
AY 10 3	8	316	5.9	188	19.4	01	5	3	45	1	0	0	0	0	0	0	0	0	0	(5)
AY 10 3	9	316	5.9	188	18.8	01	5	3	50	1	0	0	0	0	0	0	0	0	0	(5)
AY 10 3	10	NA	4.3	208	15.7	05	5													snag
AY 10 3	11	NA	4.3	208	16.2	05	5													snag
AY 10 3	12	NA	2.2	210	14.7	05	5													snag
AY 10 3	13	371	4.0	224	17.7	01	5	3	45	1	0	0	0	0	0	0	0	0	0	
AY 10 3	14	97	5.0	228	15.7	01	5	5	99	1	0	0	0	0	0	0	0	0	0	
AY 10 3	15	316	6.1	242	18.4	01	5	3	40	1	2	2	0	5	2	0	0	0	0	(6)
AY 10 3	16	316	5.3	248	22.6	01	5	3	55	1	0	0	0	0	0	0	0	0	0	
AY 10 3	17	97	4.7	302	26.0	01	5	3	90	1	0	0	0	0	0	0	0	0	0	(7)
AY 10 3	18	97	7.0	310	21.5	05	5													snag
AY 10 4	1	97	5.3	4	21.6	01	2	3	40	1	0	0	0	0	0	0	0	0	0	(8)
AY 10 4	2	97	5.5	28	17.2	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY 10 4	3	97	5.9	74	22.5	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY 10 4	4	97	5.6	82	13.9	01	2	4	25	2	0	0	0	0	0	0	0	0	0	
AY 10 4	5	97	2.4	86	23.2	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY 10 4	6	97	6.3	92	13.2	01	2	3	25	2	0	0	0	0	0	0	0	0	0	
AY 10 4	7	97	5.4	100	18.2	01	2	3	30	2	0	0	0	0	0	0	0	0	0	
AY 10 4	8	97	4.1	130	23.6	01	2	3	55	1	0	0	0	0	0	0	0	0	0	

(1) 12 woodpecker holes in roots and stump; 3 above; (2) 40% wound with decaying wood; (3) 60% wound 3' to ground; (4) several deep wounds with decayed wood; (5) trees #8 & 9 grow together with each other 3 times at 6', 10', + 15' up; okay aside from the bonding; (6) fruiting bodies where decaying limb is; decay wound above; (7) fork 20' up with decaying 3rd fork in the middle-may split; (8) forked ~20' up with 2 live leaders

Table A-3 (cont.) Tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #	Tree #	Mensuration Indicator: Tree Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Locat. on Tree	Dam. Type	Dam. Sever.	Notes (bbd = beech bark disease)
AY 10 4	9	97	2.2	144	30.0	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
AY 10 4	10	97	6.2	148	13.3	01	2	5	30	2	0	0	0	0	0	0	0	0	0	(1)
AY 10 4	11	97	7.1	156	12.8	05	2													snag; (2)
AY 10 4	12	371	5.4	188	13.7	01	2	3	40	1	0	0	0	0	0	0	0	0	0	
AY 10 4	13	97	7.3	220	22.7	01	2	3	60	1	0	0	0	0	0	0	0	0	0	forked~30'up
AY 10 4	14	97	3.8	248	36.7	01	2	3	55	1	0	0	0	0	0	0	0	0	0	
AY 10 4	15	97	6.9	252	17.0	01	2	4	30	2	0	0	0	0	0	0	0	0	0	
AY 10 4	16	97	4.2	268	16.3	05	2													snag
AY 10 4	17	97	0.8	290	13.4	05	2													snag; (3)
AY 10 4	18	97	5.0	308	38.6	01	2	3	60	1	0	0	0	0	0	0	0	0	0	(4)
AY 10 4	19	97	3.9	342	20.2	01	2	3	35	1	0	0	0	0	0	0	0	0	0	

(1) new leader formed recently; (2) maybe died this year, lots of empty little branches; (3) leaning tree that's uprooted; (4) 20' healed lightning scar

Current tree history codes: 01 means the tree was alive, 05 means it was a snag (standing dead tree with a measureable dbh)
Crown class codes: 1 = open grown, 2 = dominant, 3 = codominant, 4 = intermediate, 5 = overtopped
Crown vigor codes: 1 = high crown vigor, 2 = moderate crown vigor, 3 = low crown vigor
Current condition class codes denote forest type and stand size (Note: these codes reflect the original field assessments combined with forest type analyses results):

condition class	forest type	stand size	
1	0810	2	0810 = *Acer saccharum/Fagus grandifolia/Betula alleghaniensis*
2	0190	2	0840 = *Acer rubrum* /northern hardwoods
3	0810	1	0190 = *Picea rubens*
4	0190	1	0130 = *Picea rubens/Abioes balsamea*
5	0840	2	
6	0130	2	stand size 1=sawtimber
7	0840	1	stand size 2=poletimber

Table A-4 Sapling mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #			Mensuration Indicator: Sapl. #	Sapling Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Sapling History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Notes (bbd = be bark dise
W	1	1	1	531	2.0	2	11.8	01	1	4	60	1	2	1	8	5	1	8	6	1	7	bbd
W	1	1	2	531	0.4	91	3.3	01	1	5	90	1	2	1	6	6	1	8	0	0	0	
W	1	1	3	531	0.6	117	6.4	01	1	5	55	1	2	1	9	5	1	9	6	1	5	bbd
W	1	1	4	531	1.1	160	8.2	01	1	5	95	1	2	1	9	6	1	9	0	0	0	bbd
W	1	1	5	315	1.0	164	10.9	01	1	3	30	2	2	31	3	0	0	0	0	0	0	
W	1	1	6	531	0.7	170	8.3	01	1	5	65	1	2	1	9	5	1	9	6	1	9	bbd
W	1	1	7	531	0.3	200	9.5	01	1	4	70	1	2	1	6	5	1	9	6	1	7	bbd
W	1	1	8	531	1.5	266	7.0	01	1	5	85	1	2	1	8	5	1	3	6	1	9	bbd
W	1	1	9	531	1.0	358	3.0	01	1	5	95	2	2	1	2	6	1	9	8	21	1	bbd
W	1	2	1	97	1.3	166	5.3	01	5	5	45	2	5	1	4	6	1	3	0	0	0	
W	1	2	2	97	1.8	210	3.1	01	5	5	10	3	6	21	5	0	0	0	0	0	0	
W	1	2	3	531	1.2	294	8.5	01	5	5	65	2	2	1	9	5	1	9	6	1	9	bbd
W	1	3	1	531	1.3	66	5.1	01	1	5	70	1	2	1	9	5	1	9	6	1	9	bbd
W	1	3	2	531	1.3	66	4.3	01	1	5	55	1	2	1	9	5	1	8	6	1	7	bbd
W	1	3	3	531	1.0	76	11.5	01	1	5	65	1	2	1	9	5	1	8	6	1	5	bbd
W	1	3	4	531	0.4	265	3.4	01	1	5	15	2	2	1	4	5	1	4	6	1	3	bbd
W	1	3	5	531	0.6	336	5.4	01	1	5	35	3	2	1	6	5	1	5	6	1	5	bbd
W	1	3	6	531	0.6	344	6.5	01	1	5	65	1	2	1	8	5	1	9	6	1	9	bbd
W	1	3	7	531	0.6	344	3.7	01	1	5	75	1	2	1	8	5	1	8	6	1	7	bbd
W	1	4	NONE																			
W	2	1	NONE																			
W	2	2	NONE																			
W	2	3	1	531	1.8	69	6.0	01	1	5	75	1	2	1	9	5	1	6	6	1	8	bbd
W	2	4	NONE																			
W	3	1	1	531	0.8	14	5.1	01	1	5	50	1	2	1	9	5	1	8	6	1	7	bbd
W	3	1	2	531	1.6	56	4.9	01	1	5	55	1	2	1	9	5	1	9	6	1	5	bbd
W	3	1	3	531	1.1	144	6.2	01	1	5	60	1	2	1	8	5	1	8	6	1	9	bbd
W	3	1	4	531	1.0	284	3.3	01	1	5	70	1	2	1	9	5	1	9	6	1	8	bbd
W	3	2	1	531	1.9	6	3.6	01	1	5	50	1	2	1	9	5	1	6	6	1	8	bbd; (1)
W	3	2	2	531	1.8	32	9.6	01	1	3	15	2	2	1	9	5	1	9	6	1	3	bbd
W	3	2	3	531	1.5	225	7.7	01	1	5	75	1	2	1	9	5	1	9	6	1	9	bbd
W	3	2	4	531	1.0	329	7.1	01	1	5	60	1	2	1	9	5	1	9	6	1	9	bbd
W	3	3	NONE																			
W	3	4	NONE																			

(1) top 60% of tree is dead

Table A-4 (cont.) Sapling mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 19

Watershed & Plot # & Subplot #			Mensuration Indicator Sapl. #	Sapling Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Sapling History	Current Cond. Class	Crown Indiactor Crown Class	%Live Ratio	Crown Vigor	Damage and Mortality Indicator Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Notes (bbd = be bark dise
W	4	1	NONE																			
W	4	2	1	531	1.7	36	10.5	01	1	4	70	1	2	1	9	5	1	9	6	1	9	bbd
W	4	2	2	531	2.0	206	5.0	01	1	5	40	2	2	1	9	5	1	9	6	1	9	bbd; (1)
W	4	2	3	531	1.9	317	6.5	01	1	5	55	1	2	1	9	5	1	9	6	1	9	bbd
W	4	2	4	531	1.7	330	5.5	01	1	5	55	1	2	1	9	5	1	9	6	1	9	bbd; (2)
W	4	3	NONE																			
W	4	4	1	531	2.0	64	8.9	01	1	5	20	2	2	1	9	5	1	9	6	1	9	bbd; (3)
W	5	1	1	531	1.9	51	2.9	01	1	5	85	1	2	1	9	5	1	2	6	1	6	bbd; (4)
W	5	1	2	318	2.0	258	3.8	01	1	5	50	1	3	2	0	0	0	0	0	0	0	small (5)
W	5	2	1	531	1.0	345	6.4	01	1	5	50	1	2	1	9	5	1	9	6	1	9	bbd
W	5	3	1	531	0.7	202	4.5	01	1	5	55	1	2	1	9	5	1	8	6	1	9	bbd
W	5	3	2	318	1.7	268	6.6	01	1	5	80	1	2	2	0	6	3	5	0	0	0	twined (6
W	5	4	NONE																			
W	6	1	1	531	0.7	98	4.9	01	4	5	80	1	2	1	9	5	1	9	6	1	9	bbd
W	6	2	NONE																			
W	6	3	1	315	1.3	24	9.1	01	2	5	10	3	6	22	8	0	0	0	0	0	0	only (7)
W	6	3	2	531	1.2	158	9.0	01	2	5	95	1	2	1	6	5	1	9	6	1	8	bbd; (8)
W	6	3	3	531	1.4	192	5.2	01	2	5	99	1	2	1	5	5	1	5	6	1	9	bbd
W	6	4	1	97	2.0	324	4.7	01	4	5	45	1	0	0	0	0	0	0	0	0	0	
W	6	4	2	97	0.9	354	2.7	01	4	5	55	1	0	0	0	0	0	0	0	0	0	(9)
W	7	1	1	318	0.6	10	8.8	01	1	4	75	1	0	0	0	0	0	0	0	0	0	
W	7	1	2	318	2.0	28	12.4	01	1	3	80	1	0	0	0	0	0	0	0	0	0	
W	7	1	3	318	2.0	143	6.8	01	1	5	75	1	5	2	0	0	0	0	0	0	0	deep (10)
W	7	2	1	318	1.4	235	6.4	01	1	5	70	1	0	0	0	0	0	0	0	0	0	
W	7	2	2	531	0.6	327	7.0	01	1	5	65	1	2	1	9	5	1	9	6	1	9	bbd; (11)
W	7	3	NONE																			
W	7	4	NONE																			
W	8	1	1	97	1.6	42	11.9	01	4	5	20	2	0	0	0	0	0	0	0	0	0	
W	8	1	2	97	1.6	186	9.2	01	4	5	10	3	6	22	8	0	0	0	0	0	0	
W	8	2	NONE																			
W	8	3	1	97	2.0	128	10.7	01	2	5	40	1	0	0	0	0	0	0	0	0	0	crown (1

(1) top half of tree is dead & branches ('crown') starts half down bole; (2) top half of tree is dead & branches ('crown') starts half down bole;
(3) 25% of total tree height (50% possible crown) is dead; (4) canker at base; (5) cankers with punky wood; (6) between two other maples
(7) one live branch, crown dieback, absorbing adjacent rotten stripe maple sapling; (8) being engulfed by (beech) tree # 5 in the subplot; (9) entwinted with a large spruce seedling; (10) hole with punky wood; (11) top leader dead; (12) buried in big tree

Table A-4 (cont.) Sapling mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 19

Watershed & Plot # & Subplot #			Mensuration Indicator					Current Sapling History	Current Cond. Class	Crown Indiactor				Damage and Mortality Indicator								Notes (bbd = be bark dise
			Sapl. #	Sapling Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)			Crown Class	%Live Ratio	Crown Vigor	Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	
W	8	3	2	97	1.0	140	8.0	01	2	5	15	2	6	21	3	0	0	0	0	0	0	crown (1)
W	8	3	3	97	1.3	295	9.0	01	2	5	30	2	0	0	0	0	0	0	0	0	0	
W	8	4	NONE																			
W	9	1	1	97	1.4	65	8.2	01	2	5	20	1	0	0	0	0	0	0	0	0	0	
W	9	1	2	97	0.5	203	5.0	01	2	5	25	2	6	22	5	0	0	0	0	0	0	
W	9	1	3	97	1.8	299	4.4	01	2	5	15	3	6	22	8	0	0	0	0	0	0	
W	9	2	1	315	0.7	204	7.0	01	4	5	25	2	0	0	0	0	0	0	0	0	0	
W	9	2	2	371	1.6	267	3.7	01	4	5	60	2	6	2	0	0	0	0	0	0	0	dead (2)
W	9	3	NONE																			
W	9	4	NONE																			
W	10	1	1	371	0.8	102	3.2	01	2	5	60	1	0	0	0	0	0	0	0	0	0	
W	10	1	2	97	1.7	167	4.0	01	2	5	99	1	0	0	0	0	0	0	0	0	0	
W	10	1	3	371	0.8	167	8.0	01	2	5	55	1	4	2	0	0	0	0	0	0	0	30% (3)
W	10	1	4	371	0.7	167	4.7	01	2	5	55	1	0	0	0	0	0	0	0	0	0	
W	10	2	NONE																			
W	10	3	NONE																			
W	10	4	1	97	0.6	360	3.4	01	1	5	70	1	0	0	0	0	0	0	0	0	0	
E	1	1	1	531	1.8	110	2.5	01	7	5	90	1	2	1	2	6	3	5	0	0	0	bbd
E	1	2	NONE																			
E	1	3	1	531	2.0	143	12.1	01	1	5	70	1	2	1	9	5	1	9	6	1	9	bbd
E	1	4	NONE																			
E	2	1	1	531	1.7	76	5.7	01	3	5	55	1	2	1	9	5	1	9	6	1	8	bbd
E	2	1	2	531	1.5	152	4.7	01	3	5	75	1	2	1	9	5	1	9	6	1	9	bbd
E	2	1	3	531	1.3	190	2.7	01	3	5	45	1	2	1	9	5	1	9	6	1	4	bbd
E	2	1	4	531	1.7	252	8.1	01	3	5	85	1	2	1	9	5	1	9	6	1	9	bbd
E	2	1	5	531	0.8	350	3.7	01	3	5	100	1	2	1	2	0	0	0	0	0	0	crown (4)
E	2	1	6	97	1.4	356	3.5	01	3	5	30	2	0	0	0	0	0	0	0	0	0	
E	2	2	1	97	1.7	30	4.5	01	1	5	25	2	4	31	0	0	0	0	0	0	0	bent (5)
E	2	2	2	97	1.2	164	6.4	01	1	5	65	1	0	0	0	0	0	0	0	0	0	
E	2	3	NONE																			
E	2	4	NONE																			

(1) buried in big tree; (2) top; short leisions (2") but several with a 2' area of lower bole all the way around with decay, covers 80% circumference of bole;
(3) open wound with rot; (4) trapped under falling branches and sapling is bent in half w/ couple of branches trying to be new leaders;
(5) on the ground nearly! ~3 m tall otherwise, but now total height is only 1/2 m tall

Table A-4 (cont.) Sapling mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 19

Watershed & Plot # & Subplot #			Mensuration Indicator Sapl. #	Sapling Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Sapling History	Current Cond. Class	Crown Indiactor Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Notes (bbd = be bark dise
E	3	1	1	531	0.2	171	4.7	01	1	5	65	1	1	11	0	4	1	9	6	1	9	bbd; (1)
E	3	2	1	97	1.5	148	6.2	01	4	5	40	1	0	0	0	0	0	0	0	0	0	
E	3	3	1	531	0.9	31	7.9	01	1	5	90	1	2	1	9	5	1	9	6	1	9	bbd
E	3	3	2	531	1.4	38	5.1	01	1	5	55	1	2	1	9	5	1	9	6	1	7	bbd
E	3	3	3	531	0.6	354	8.3	01	1	5	95	1	2	1	9	5	1	9	6	1	9	bbd; (2)
E	3	4	1	531	1.1	47	5.9	01	1	5	60	1	2	1	9	4	1	6	6	1	8	bbd
E	3	4	2	531	0.9	64	4.1	01	1	5	80	1	2	1	9	4	1	5	6	1	5	bbd
E	3	4	3	531	1.7	114	6.8	01	1	5	95	1	2	1	9	6	1	8	0	0	0	
E	3	4	4	531	1.8	186	4.3	01	1	5	65	1	2	1	8	4	1	7	6	1	7	bbd
E	4	1	1	371	1.6	30	5.2	01	4	5	90	2	6	2	0	0	0	0	0	0	0	
E	4	1	2	12	1.7	54	9.1	01	4	5	30	2	0	0	0	0	0	0	0	0	0	
E	4	1	3	935	1.6	64	4.5	01	4	5	55	1	2	2	0	6	3	4	0	0	0	
E	4	1	4	12	1.4	66	5.9	01	4	5	40	1	2	2	0	0	0	0	0	0	0	
E	4	1	5	371	0.5	116	3.9	01	4	5	15	2	3	2	0	0	0	0	0	0	0	
E	4	1	6	371	1.8	132	12.4	01	4	4	50	1	0	0	0	0	0	0	0	0	0	
E	4	2	1	531	0.6	24	3.5	01	5	5	20	1	2	1	9	5	1	9	6	1	4	bbd
E	4	2	2	531	0.6	26	3.7	01	5	5	45	1	2	1	9	5	1	9	6	1	9	bbd
E	4	2	3	97	1.1	174	6.7	01	5	5	80	1	0	0	0	0	0	0	0	0	0	
E	4	2	4	531	0.6	290	3.8	01	5	5	65	2	2	1	9	5	1	8	6	1	9	bbd
E	4	2	5	531	1.8	300	4.6	01	5	5	65	1	2	1	9	5	1	9	6	1	8	bbd
E	4	2	6	531	1.8	300	6.1	01	5	5	60	1	2	1	9	5	1	7	6	1	7	bbd
E	4	2	7	97	1.6	357	7.6	01	5	5	55	1	0	0	0	0	0	0	0	0	0	
E	4	3	1	531	1.3	18	5.5	01	1	5	75	1	2	1	8	5	1	8	6	1	9	bbd
E	4	3	2	531	1.0	58	7.2	01	1	5	75	1	2	1	8	5	1	9	6	1	9	bbd
E	4	3	3	531	1.6	136	3.9	01	1	5	70	1	2	1	9	5	1	8	6	1	3	bbd
E	4	3	4	531	1.5	232	3.2	01	1	5	85	1	2	1	7	5	1	3	6	1	7	bbd
E	4	4	1	371	1.5	24	4.0	01	6	5	25	2	2	2	0	0	0	0	0	0	0	
E	4	4	2	12	2.0	147	2.5	01	6	5	15	2	0	0	0	0	0	0	0	0	0	
E	4	4	3	12	1.9	166	7.5	01	6	5	55	1	0	0	0	0	0	0	0	0	0	
E	4	4	4	12	2.0	248	3.9	01	6	5	35	1	0	0	0	0	0	0	0	0	0	
E	4	4	5	12	1.2	286	3.1	01	6	5	30	2	0	0	0	0	0	0	0	0	0	
E	4	4	6	316	1.3	286	6.2	01	6	4	35	1	3	3	4	0	0	0	0	0	0	wound (3
E	4	4	7	12	1.4	288	7.1	01	6	5	40	1	3	3	2	0	0	0	0	0	0	wound (4

(1) leaning at a 35 degree angle to the ground; (2) dead leader; (3) around sapling # 7; (4) around sapling # 6

Table A-4 (cont.) Sapling mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 19

Watershed & Plot # & Subplot #			Sapl. #	Mensuration Indicator: Sapling Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Sapling History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Notes (bbd = be bark dise
E	5	1	1	531	1.8	54	6.6	01	5	5	85	1	2	1	9	5	1	7	6	1	7	bbd
E	5	1	2	531	1.5	56	10.3	01	5	4	70	1	2	1	9	5	1	8	6	1	6	bbd
E	5	1	3	531	1.5	56	7.4	01	5	5	80	1	2	1	9	5	1	4	6	1	9	bbd
E	5	1	4	531	1.9	85	4.5	01	5	5	75	1	2	1	9	5	1	4	6	1	8	bbd
E	5	1	5	531	1.9	85	7.7	01	5	5	35	1	2	1	9	5	1	9	6	1	9	bbd
E	5	1	6	531	1.9	126	3.6	01	5	5	99	2	2	1	5	6	1	9	0	0	0	bbd
E	5	2	1	12	0.4	18	2.8	01	7	5	25	1	3	11	0	5	3	4	6	21	6	bole (1)
E	5	2	2	531	1.4	93	4.8	01	7	5	95	1	2	1	3	6	1	9	0	0	0	bbd
E	5	2	3	12	1.1	225	2.8	01	7	5	55	1	0	0	0	0	0	0	0	0	0	burnt (2)
E	5	3	1	316	1.7	156	8.0	01	5	5	20	2	2	2	0	6	21	7	0	0	0	crown (3)
E	5	4	NONE																			
E	6	1	NONE																			
E	6	2	1	318	0.5	138	11.3	01	4	3	80	1	0	0	0	0	0	0	0	0	0	
E	6	3	NONE																			
E	6	4	1	97	1.2	68	10.6	01	5	5	80	1	0	0	0	0	0	0	0	0	0	
E	6	4	2	97	1.2	310	10.5	01	5	5	90	1	0	0	0	0	0	0	0	0	0	
E	7	1	NONE																			
E	7	2	NONE																			
E	7	3	NONE																			
E	7	4	1	316	1.4	140	8.5	01	2	5	35	1	0	0	0	0	0	0	0	0	0	
E	7	4	2	97	2.0	218	9.8	01	2	5	60	3	6	21	7	0	0	0	0	0	0	top (4)
E	7	4	3	97	0.7	327	9.2	01	2	5	60	1	0	0	0	0	0	0	0	0	0	lost (5)
E	8	1	NONE																			
E	8	2	1	315	1.8	153	10.3	01	1	5	25	2	2	2	0	6	22	2	0	0	0	leaning (6
E	8	3	1	531	2.0	311	6.2	01	1	5	40	1	2	1	9	5	1	9	6	1	7	
E	8	4	1	531	1.9	310	11.9	01	1	5	75	1	2	1	9	5	1	9	6	1	9	
E	9	1	1	531	1.4	60	5.7	01	1	5	95	1	2	1	9	5	1	9	6	1	9	bbd
E	9	1	2	531	1.6	271	3.9	01	1	5	60	1	2	1	9	5	1	9	6	1	8	bbd; (7)
E	9	2	NONE																			
E	9	3	1	531	1.2	64	5.7	01	1	5	80	1	2	1	9	5	1	8	6	1	8	bbd
E	9	3	2	531	0.9	160	3.7	01	1	5	95	1	2	1	9	5	1	9	6	1	9	bbd

(1) broke-another tree fell on it & this years growth is on the ground, dead crown top, but new growth along the branches on the bole;
(2) looking needles & dieback; (3) dieback (1/3 of sapling is dead); (4) dead, only one live branch way down;
(5) leader twice at 5' & 10" top is forked-3 leaders, 1/2 crown, 1 side dead ?; (6) top 30% of canopy is dead branches; (7) leader is dead

Table A-4 (cont.) Sapling mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 19

Watershed & Plot # & Subplot #	Sapl. #	Mensuration Indicator: Sapling Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Sapling History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Notes (bbd = be bark dise
E 9 3	3	318	2.0	325	4.2	01	1	5	95	1	0	0	0	0	0	0	0	0	0	
E 9 4	NONE																			
E 10 1	NONE																			
E 10 2	1	531	1.4	120	6.2	01	5	5	80	1	2	1	9	5	1	9	6	1	9	bbd
E 10 3	NONE																			
E 10 4	1	531	2.05	288	9.4	01	1	5	40	1	2	1	9	5	1	9	6	1	9	bbd
AY 1 1	1	97	1.8	57	10.9	01	1	5	60	1	0	0	0	0	0	0	0	0	0	
AY 1 1	2	531	1.7	100	3.5	01	1	5	75	1	2	1	2	5	1	2	0	0	0	bbd
AY 1 2	1	531	1.8	345	3.2	01	1	5	95	1	2	1	9	6	1	9	0	0	0	bbd
AY 1 3	1	531	1.6	325	4.5	01	3	5	65	1	2	1	9	5	1	9	6	1	9	bbd
AY 1 4	1	531	1.2	35	5.5	01	5	5	75	1	2	1	9	5	1	7	6	1	9	bbd
AY 1 4	2	531	1.6	190	10.2	01	5	4	80	1	2	1	9	5	1	9	6	1	9	bbd
AY 2 1	1	97	0.9	14	8.5	01	2	5	50	1	0	0	0	0	0	0	0	0	0	
AY 2 1	2	97	1.1	303	7.1	01	2	5	50	1	0	0	0	0	0	0	0	0	0	
AY 2 1	3	97	1.2	322	8.0	01	2	5	25	2	0	0	0	0	0	0	0	0	0	
AY 2 1	4	97	1.6	334	12.3	01	2	4	15	2	6	21	5	0	0	0	0	0	0	
AY 2 2	1	12	1.8	120	4.1	01	4	5	60	1	0	0	0	0	0	0	0	0	0	forked
AY 2 3	NONE																			
AY 2 4	NONE																			
AY 3 1	NONE																			
AY 3 2	1	371	1.0	312	9.8	01	6	4	65	1	0	0	0	0	0	0	0	0	0	
AY 3 3	NONE																			
AY 3 4	1	97	0.5	255	11.2	01	6	5	50	1	0	0	0	0	0	0	0	0	0	
AY 4 1	1	935	1.0	42	12.0	01	6	3	45	1	0	0	0	0	0	0	0	0	0	
AY 4 1	2	935	0.9	46	10.8	01	6	3	20	2	2	2	0	0	0	0	0	0	0	
AY 4 1	3	935	1.3	69	5.9	01	6	5	50	1	0	0	0	0	0	0	0	0	0	
AY 4 1	4	935	1.1	69	9.3	01	6	3	95	1	3	2	0	0	0	0	0	0	0	
AY 4 1	5	935	1.1	69	9.9	01	6	3	30	2	3	2	0	0	0	0	0	0	0	rubbing
AY 4 1	6	935	1.1	69	11.2	01	6	3	35	1	0	0	0	0	0	0	0	0	0	
AY 4 1	7	97	1.7	170	6.2	01	6	5	95	1	0	0	0	0	0	0	0	0	0	
AY 4 1	8	97	1.9	221	7.1	01	6	5	90	1	0	0	0	0	0	0	0	0	0	
AY 4 2	NONE																			
AY 4 3	NONE																			
AY 4 4	NONE																			
AY 5 1	1	531	1.1	67	2.8	01	1	5	85	1	2	1	9	5	1	9	6	1	9	bbd

Table A-4 (cont.) Sapling mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 19

Watershed & Plot # & Subplot #	Sapl. #	Mensuration Indicator: Sapling Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Sapling History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Crown Ratio	Crown Vigor	Damage and Mortality Indicator: Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Notes (bbd = be bark dise
AY 5 1	2	531	1.7	153	4.9	01	1	5	50	1	2	1	9	5	1	9	6	1	4	bbd
AY 5 2	1	531	1.6	147	9.0	01	3	5	95	1	2	1	9	5	1	9	6	1	9	bbd; (1)
AY 5 3	1	531	2.0	3	4.2	01	1	5	55	1	2	1	9	5	1	9	6	1	9	bbd
AY 5 3	2	531	1.2	43	4.4	01	1	5	40	1	2	1	9	5	1	9	6	1	9	bbd; (2)
AY 5 3	3	531	1.7	68	4.0	01	1	5	45	1	2	1	9	5	1	9	6	1	9	bbd; (3)
AY 5 3	4	531	1.4	83	5.2	01	1	5	75	1	2	1	9	5	1	9	6	1	9	bbd
AY 5 3	5	531	1.8	120	6.2	01	1	5	75	1	2	1	9	5	1	9	6	1	9	bbd
AY 5 3	6	531	1.8	136	9.0	01	1	4	60	1	2	1	9	5	1	9	6	1	9	bbd
AY 5 3	7	531	0.5	347	6.1	01	1	5	80	1	2	1	9	5	1	9	6	1	9	bbd
AY 5 4	NONE																			
AY 6 1	1	531	2.0	85	5.0	01	1	5	65	1	2	1	9	5	1	9	6	1	9	bbd; (4)
AY 6 2	1	531	1.4	292	3.0	01	1	5	55	1	2	1	9	5	1	9	6	1	8	bbd; (5)
AY 6 3	1	531	0.8	146	10.7	01	1	4	55	1	2	1	9	5	1	9	6	1	9	bbd
AY 6 4	1	531	1.3	93	5.5	01	1	5	55	1	2	1	9	5	1	9	6	1	9	bbd; (6)
AY 6 4	2	531	2.0	146	7.1	01	1	5	20	2	2	1	9	5	1	9	6	1	9	bbd; (7)
AY 7 1	1	97	1.5	4	8.0	01	2	5	40	1	6	21	2	0	0	0	0	0	0	dead lead
AY 7 1	2	316	1.5	33	8.0	01	2	4	70	1	0	0	0	0	0	0	0	0	0	
AY 7 1	3	97	0.3	82	3.4	01	2	5	35	3	0	0	0	0	0	0	0	0	0	
AY 7 1	4	316	0.4	115	6.6	01	2	5	95	1	3	2	0	0	0	0	0	0	0	
AY 7 1	5	316	1.3	200	8.0	01	2	4	40	1	0	0	0	0	0	0	0	0	0	
AY 7 1	6	97	1.3	240	11.9	01	2	3	35	1	0	0	0	0	0	0	0	0	0	
AY 7 2	1	97	1.8	151	9.2	01	2	5	40	1	0	0	0	0	0	0	0	0	0	
AY 7 3	1	531	1.4	260	11.4	01	5	4	75	1	2	1	9	5	1	8	6	1	8	bbd
AY 7 3	2	531	1.8	320	9.3	01	5	5	45	1	2	1	9	5	1	9	6	1	8	bbd; (8)
AY 7 4	NONE																			
AY 8 1	NONE																			
AY 8 2	1	97	0.5	58	11.6	01	5	5	20	2	0	0	0	0	0	0	0	0	0	double (9
AY 8 3	NONE																			
AY 8 4	1	316	1.5	282	7.7	01	2	3	60	1	0	0	0	0	0	0	0	0	0	
AY 9 1	1	315	0.7	222	5.3	01	2	5	10	3	6	22	8	0	0	0	0	0	0	small (10
AY 9 1	2	315	1.5	274	5.6	01	2	5	45	1	3	2	0	0	0	0	0	0	0	
AY 9 2	NONE																			

(1) lower 50% of old crown is alive (top dieback); (2) top dead; (3) top dead; (4) dead top; dead leader; (5) dead leader; (6) dead top; dead leader; (7) dead top; dead leader; (8) and leaning; (9) leader at top, 25% of the bole length "forked"; (10) wound 6'up

Table A-4 (cont.) Sapling mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 19

Watershed & Plot # & Subplot	Sapl. #	Mensuration Indicator: Sapling Species	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Sapling History	Current Cond. Class	Crown Indiactor: Crown Class	%Live Ratio	Crown Vigor	Locat. on Sap.	Dam. Type	Damage and Mortality Indicator: Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Locat. on Sap.	Dam. Type	Dam. Sever.	Notes (bbd = be bark dise
AY 9	3	NONE																		
AY 9	4	NONE																		
AY 10	1	NONE																		
AY 10	2	NONE																		
AY 10	3	NONE																		
AY 10	4	NONE																		

Crown class codes: 1 = open grown, 2 = dominant, 3 = codominant, 4 = intermediate, 5 = overtopped

Crown vigor codes: 1 = high crown vigor, 2 = moderate crown vigor, 3 = low crown vigor

Current condition class codes denote forest type and stand size (Note: these codes reflect the original field assessments combined with forest type analyses results):

condition class	forest type	stand size	
1	0810	2	0810 = *Acer saccharum/Fagus grandifolia/Betula alleghaniensis*
2	0190	2	0840 = *Acer rubrum* /northern hardwoods
3	0810	1	0190 = *Picea rubens*
4	0190	1	0130 = *Picea rubens/Abioes balsamea*
5	0840	2	
6	0130	2	stand size 1=sawtimber
7	0840	1	stand size 2=poletimber

Table A-5 Seedling mensuration and crown indicator raw data from Bear Brook Watershe in Maine in 1997

Watershed	Plot #	Subplot #	Seedling Species	Condition Class	Crown Class	Crown Vigor	Seedling Count
W	1	1	318	1	5	1	2
W	1	1	531	1	5	1	2
W	1	1	531	1	5	2	1
W	1	2	531	1	5	1	1
W	1	3	531	1	5	1	1
W	1	4	318	1	5	1	3
W	1	4	371	1	5	1	7
W	1	4	371	1	5	2	1
W	2	1	315	3	5	1	19
W	2	1	318	3	5	1	5
W	2	1	371	3	5	1	1
W	2	1	531	3	5	1	1
W	2	2	315	3	5	1	11
W	2	2	318	3	5	1	97
W	2	2	318	3	5	3	1
W	2	2	371	3	5	1	5
W	2	2	531	3	5	1	2
W	2	2	531	3	5	2	1
W	2	2	531	3	5	3	1
W	2	3	315	1	5	1	1
W	2	3	315	1	5	2	2
W	2	3	318	1	5	1	2
W	2	3	531	1	5	1	4
W	2	4	315	1	5	1	32
W	2	4	315	1	5	2	1
W	2	4	318	1	5	1	50
W	2	4	318	1	5	2	1
W	2	4	371	1	5	1	1
W	2	4	531	1	5	1	4
W	2	4	531	1	5	3	1
W	3	1	315	1	5	1	1
W	3	1	315	1	5	2	2
W	3	1	315	1	5	3	1
W	3	1	531	1	5	1	1
W	3	2	315	1	5	1	59
W	3	2	316	1	5	1	1
W	3	2	318	1	5	1	5
W	3	2	371	1	5	1	1
W	3	2	531	1	5	1	7
W	3	3	97	1	5	1	2
W	3	3	97	1	5	2	2
W	3	3	371	1	5	1	2
W	3	3	371	1	5	2	1
W	3	3	531	1	5	1	16
W	3	3	531	1	5	2	2
W	3	4	315	1	5	1	2
W	3	4	371	1	5	1	11
W	4	1	97	1	5	1	1
W	4	1	318	1	5	1	46
W	4	1	371	1	5	1	7
W	4	1	371	1	5	2	1
W	4	1	531	1	5	1	2

Table A-5 (cont.) Seedling mensuration and crown indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed	Plot #	Subplot #	Seedling Species	Condition Class	Crown Class	Crown Vigor	Seedling Count
W	4	2	531	1	5	2	1
W	4	3	97	1	5	1	1
W	4	3	315	1	5	1	2
W	4	3	318	1	5	1	7
W	4	3	371	1	5	1	3
W	4	3	531	1	5	1	1
W	4	3	531	1	5	2	1
W	4	4	315	1	5	1	27
W	4	4	315	1	5	2	1
W	4	4	318	1	5	1	3
W	4	4	318	1	5	2	1
W	4	4	371	1	5	1	6
W	4	4	371	1	5	2	1
W	4	4	531	1	5	1	2
W	5	1	315	1	5	1	1
W	5	1	318	1	5	1	13
W	5	1	318	1	5	2	2
W	5	1	371	1	5	1	1
W	5	1	531	1	5	1	1
W	5	2	315	1	5	1	2
W	5	2	371	1	5	1	3
W	5	2	531	1	5	1	2
W	5	3	315	1	5	1	4
W	5	3	531	1	5	1	2
W	5	4	315	1	5	1	1
W	5	4	318	1	5	2	1
W	5	4	531	1	5	3	1
W	6	1	315	2	5	1	1
W	6	1	371	2	5	1	16
W	6	2	315	1	5	1	1
W	6	2	316	1	5	1	1
W	6	2	318	1	5	1	2
W	6	2	531	1	5	1	4
W	6	3	315	1	5	1	4
W	6	4	97	2	5	1	2
W	6	4	97	2	5	2	2
W	6	4	97	2	5	3	3
W	7	1	318	1	5	1	3
W	7	2	318	1	5	1	1
W	7	2	531	1	5	1	5
W	7	3	97	1	5	1	1
W	7	3	316	1	5	1	2
W	7	3	371	1	5	1	1
W	7	4	315	1	5	1	12
W	7	4	531	1	5	1	4
W	7	4	371	1	5	1	1
W	8	1	NONE				
W	8	2	NONE				
W	8	3	NONE				
W	8	4	NONE				
W	9	1	NONE				
W	9	2	531	2	5	1	1

Table A-5 (cont.) Seedling mensuration and crown indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed	Plot #	Subplot #	Seedling Species	Condition Class	Crown Class	Crown Vigor	Seedling Count
W	9	4	97	2	5	1	3
W	9	4	97	2	5	2	1
W	9	4	97	2	5	3	6
W	10	1	97	2	5	1	1
W	10	2	97	1	5	2	1
W	10	3	315	1	5	1	2
W	10	3	315	1	5	3	1
W	10	4	NONE				
E	1	1	97	5	5	1	1
E	1	1	97	5	5	3	1
E	1	1	315	5	5	1	4
E	1	1	316	5	5	1	3
E	1	1	371	5	5	1	14
E	1	1	371	5	5	2	1
E	1	1	531	5	5	1	2
E	1	2	315	1	5	1	13
E	1	2	315	1	5	2	1
E	1	2	318	1	5	1	2
E	1	2	531	1	5	1	3
E	1	3	261	1	5	1	3
E	1	3	315	1	5	1	1
E	1	3	318	1	5	1	3
E	1	4	97	1	5	1	1
E	1	4	12	1	5	1	1
E	1	4	315	1	5	1	4
E	1	4	315	1	5	2	1
E	1	4	316	1	5	1	1
E	1	4	318	1	5	1	1
E	1	4	371	1	5	1	1
E	1	4	531	1	5	1	1
E	2	1	97	3	5	1	1
E	2	1	315	3	5	1	1
E	2	1	371	3	5	1	4
E	2	2	97	1	5	1	2
E	2	2	315	1	5	1	1
E	2	2	371	1	5	1	13
E	2	2	371	1	5	2	1
E	2	2	531	1	5	1	2
E	2	3	97	1	5	1	4
E	2	3	315	1	5	1	13
E	2	3	318	1	5	1	3
E	2	3	371	1	5	1	26
E	2	3	371	1	5	2	1
E	2	3	531	1	5	1	3
E	2	3	541	1	5	1	1
E	2	4	12	1	5	1	1
E	2	4	315	1	5	1	1
E	2	4	316	1	5	1	1
E	2	4	371	1	5	1	54
E	2	4	371	1	5	2	5
E	2	4	371	1	5	3	1
E	2	4	531	1	5	1	3

Table A-5 (cont.) Seedling mensuration and crown indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed	Plot #	Subplot #	Seedling Species	Condition Class	Crown Class	Crown Vigor	Seedling Count
E	3	1	NONE				
E	3	2	97	4	5	1	1
E	3	3	315	1	5	1	3
E	3	3	315	1	5	2	1
E	3	3	315	1	5	3	1
E	3	3	531	1	5	1	5
E	3	4	315	1	5	1	1
E	3	4	318	1	5	1	1
E	3	4	531	1	5	1	4
E	4	1	12	2	5	3	1
E	4	1	97	2	5	2	1
E	4	1	371	2	5	1	1
E	4	1	935	2	5	1	4
E	4	2	12	1	5	1	2
E	4	2	12	1	5	2	1
E	4	2	531	1	5	3	1
E	4	3	531	1	5	2	1
E	4	4	12	6	5	1	1
E	4	4	12	6	5	2	1
E	4	4	12	6	5	3	1
E	4	4	97	6	5	1	1
E	4	4	97	6	5	3	1
E	5	1	531	1	5	1	5
E	5	2	97	1	5	1	1
E	5	2	531	1	5	1	1
E	5	3	97	5	5	1	1
E	5	3	316	5	5	1	3
E	5	3	531	5	5	2	1
E	5	4	97	2	5	1	1
E	5	4	315	2	5	1	5
E	5	4	316	2	5	1	3
E	5	4	371	2	5	1	11
E	5	4	531	2	5	1	5
E	6	1	NONE				
E	6	2	315	4	5	1	1
E	6	2	318	4	5	2	1
E	6	2	371	4	5	1	9
E	6	2	531	4	5	1	2
E	6	2	531	4	5	2	2
E	6	3	NONE				
E	6	4	531	1	5	1	1
E	7	1	315	1	5	1	1
E	7	1	316	1	5	1	2
E	7	1	318	1	5	1	4
E	7	1	318	1	5	2	1
E	7	1	371	1	5	1	2
E	7	1	531	1	5	1	4
E	7	2	315	1	5	1	1
E	7	2	318	1	5	1	3
E	7	2	531	1	5	1	2
E	7	3	531	1	5	1	4
E	7	4	316	2	5	1	3

Table A-5 (cont.) Seedling mensuration and crown indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed	Plot #	Subplot #	Seedling Species	Condition Class	Crown Class	Crown Vigor	Seedling Count
E	8	1	316	1	5	1	3
E	8	1	316	1	5	2	2
E	8	1	371	1	5	1	8
E	8	1	531	1	5	1	6
E	8	1	531	1	5	2	4
E	8	2	12	1	5	2	1
E	8	2	97	1	5	1	1
E	8	2	315	1	5	1	3
E	8	2	371	1	5	1	1
E	8	3	315	1	5	1	2
E	8	3	316	1	5	1	1
E	8	3	318	1	5	1	2
E	8	3	371	1	5	1	5
E	8	3	531	1	5	1	20
E	8	4	315	1	5	1	3
E	8	4	316	1	5	1	3
E	8	4	316	1	5	2	1
E	8	4	371	1	5	1	12
E	8	4	371	1	5	2	1
E	8	4	531	1	5	1	1
E	8	4	935	1	5	1	1
E	9	1	371	1	5	1	1
E	9	1	531	1	5	1	6
E	9	1	531	1	5	2	5
E	9	2	371	1	5	1	1
E	9	2	531	1	5	2	1
E	9	3	315	1	5	1	1
E	9	3	531	1	5	1	7
E	9	3	763	1	5	1	4
E	9	4	315	1	5	1	10
E	9	4	531	1	5	1	8
E	10	1	97	1	5	1	1
E	10	1	316	1	5	1	3
E	10	1	531	1	5	1	1
E	10	1	763	1	5	1	12
E	10	1	763	1	5	2	1
E	10	1	935	1	5	1	1
E	10	2	316	1	5	1	2
E	10	2	318	1	5	1	1
E	10	2	531	1	5	1	2
E	10	2	531	1	5	2	1
E	10	3	NONE				
E	10	4	371	1	5	1	4
AY	1	1	315	1	5	1	4
AY	1	1	318	1	5	2	1
AY	1	1	371	1	5	1	5
AY	1	1	371	1	5	3	1
AY	1	1	531	1	5	1	1
AY	1	1	531	1	5	3	1
AY	1	1	762	1	5	1	1
AY	1	2	97	1	5	1	1
AY	1	2	318	1	5	1	1

Table A-5 (cont.) Seedling mensuration and crown indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed	Plot #	Subplot #	Seedling Species	Condition Class	Crown Class	Crown Vigor	Seedling Count
AY	1	3	318	1	5	1	20
AY	1	3	318	1	5	2	1
AY	1	3	371	1	5	1	4
AY	1	3	531	1	5	1	4
AY	1	3	531	1	5	2	1
AY	1	4	318	1	5	1	7
AY	1	4	371	1	5	1	4
AY	2	1	12	2	5	1	1
AY	2	1	97	2	5	1	4
AY	2	1	531	2	5	1	2
AY	2	2	12	4	5	1	1
AY	2	2	97	4	5	1	1
AY	2	2	97	4	5	3	1
AY	2	3	97	2	5	1	17
AY	2	3	97	2	5	2	2
AY	2	3	97	2	5	3	2
AY	2	4	97	1	5	1	1
AY	2	4	315	1	5	1	2
AY	2	4	531	1	5	1	1
AY	3	1	NONE				
AY	3	2	NONE				
AY	3	3	12	6	5	1	1
AY	3	3	97	6	5	2	1
AY	3	4	NONE				
AY	4	1	97	2	5	1	1
AY	4	1	935	2	5	1	4
AY	4	1	935	2	5	2	1
AY	4	2	NONE				
AY	4	3	NONE				
AY	4	4	NONE				
AY	5	1	315	1	5	1	3
AY	5	1	531	1	5	1	3
AY	5	1	531	1	5	2	1
AY	5	1	935	1	5	1	1
AY	5	2	315	1	5	1	21
AY	5	2	316	1	5	1	1
AY	5	2	318	1	5	1	3
AY	5	2	371	1	5	1	1
AY	5	2	371	1	5	2	1
AY	5	2	531	1	5	1	12
AY	5	2	763	1	5	1	2
AY	5	2	935	1	5	1	1
AY	5	3	315	1	5	1	10
AY	5	3	315	1	5	2	1
AY	5	3	531	1	5	1	1
AY	5	3	531	1	5	2	3
AY	5	3	935	1	5	1	2
AY	5	4	315	1	5	1	6
AY	5	4	316	1	5	1	12
AY	5	4	316	1	5	2	1
AY	5	4	318	1	5	1	2
AY	5	4	371	1	5	1	1

Table A-5 (cont.) Seedling mensuration and crown indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed	Plot #	Subplot #	Seedling Species	Condition Class	Crown Class	Crown Vigor	Seedling Count
AY	6	1	315	1	5	1	1
AY	6	1	318	1	5	1	2
AY	6	1	371	1	5	1	13
AY	6	2	318	1	5	1	1
AY	6	2	531	1	5	1	10
AY	6	2	531	1	5	2	1
AY	6	3	531	1	5	1	7
AY	6	4	97	1	5	1	1
AY	6	4	315	1	5	1	2
AY	6	4	316	1	5	1	2
AY	6	4	318	1	5	1	3
AY	6	4	371	1	5	1	7
AY	6	4	531	1	5	1	2
AY	7	1	NONE				
AY	7	2	315	2	5	1	1
AY	7	2	315	2	5	2	1
AY	7	2	316	2	5	1	1
AY	7	2	531	2	5	1	1
AY	7	2	833	2	5	1	1
AY	7	3	315	1	5	1	36
AY	7	3	315	1	5	2	1
AY	7	3	316	1	5	1	21
AY	7	3	318	1	5	1	9
AY	7	3	371	1	5	1	7
AY	7	3	371	1	5	2	2
AY	7	3	531	1	5	1	20
AY	7	3	531	1	5	2	3
AY	7	3	541	1	5	1	1
AY	7	3	833	1	5	1	1
AY	7	4	97	2	5	1	1
AY	7	4	315	2	5	1	1
AY	7	4	316	2	5	1	2
AY	7	4	316	2	5	2	1
AY	7	4	371	2	5	1	9
AY	7	4	371	2	5	2	1
AY	8	1	NONE				
AY	8	2	371	1	5	3	1
AY	8	3	NONE				
AY	8	4	NONE				
AY	9	1	315	2	5	1	11
AY	9	2	315	1	5	1	6
AY	9	2	315	1	5	2	3
AY	9	2	316	1	5	2	2
AY	9	2	371	1	5	2	1
AY	9	2	371	1	5	3	2
AY	9	2	531	1	5	3	1
AY	9	2	762	1	5	1	7
AY	9	2	763	1	5	1	1
AY	9	2	833	1	5	1	1
AY	9	3	97	7	5	1	1
AY	9	4	NONE				
AY	10	1	NONE				

Table A-5 (cont.) Seedling mensuration and crown indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed	Plot #	Subplot #	Seedling Species	Condition Class	Crown Class	Crown Vigor	Seedling Count
AY	10	3	12	5	5	1	2
AY	10	3	97	5	5	1	3
AY	10	3	316	5	5	1	1
AY	10	3	935	5	5	1	2
AY	10	4	NONE				

Crown class codes: 1 = open grown, 2 = dominant, 3 = codominant, 4 = intermediate, 5 = overtopped
Crown vigor codes: 1 = high crown vigor, 2 = moderate crown vigor, 3 = low crown vigor
Current condition class codes denote forest type and stand size (Note: some of the original field determinations were altered following forest type analyses):

condition class	forest type	stand size	
1	0810	2	0810 = *Acer saccharum/Fagus grandifolia/Betula alleghaniensis*
2	0190	2	0840 = *Acer rubrum* /northern hardwoods
3	0810	1	0190 = *Picea rubens*
4	0190	1	0130 = *Picea rubens/Abioes balsamea*
5	0840	2	
6	0130	2	stand size 1=sawtimber
7	0840	1	stand size 2=poletimber

Table A-6. Forest Mensuration Indicator: percent cover of understory plant categories within the 2.07-m (12-ft) radius microplots at BBWM in 1997

	moss (%cover)	ferns (%cover)	herbs (%cover)	shrubs (%cover)	seedlings (%cover)	lichen (%cover)	Total (%cover)
W-1-1	1	1	1	0	1	1	5
W-1-2	1	0	5	1	1	1	9
W-1-3	1	5	15	0	5	1	27
W-1-4	1	10	20	5	5	1	42
W-2-1	5	1	25	0	5	1	37
W-2-2	5	35	5	5	20	1	71
W-2-3	10	1	1	1	1	10	24
W-2-4	1	0	1	10	5	1	18
W-3-1	1	0	0	1	1	1	4
W-3-2	1	1	5	50	10	1	68
W-3-3	1	1	5	0	1	1	9
W-3-4	5	1	25	1	1	10	43
W-4-1	1	30	20	15	10	1	77
W-4-2	1	0	1	0	1	1	4
W-4-3	1	10	25	1	5	1	43
W-4-4	1	1	5	45	5	1	58
W-5-1	1	55	5	1	1	1	64
W-5-2	1	1	15	0	10	1	28
W-5-3	1	10	1	5	10	1	28
W-5-4	1	95	5	15	1	5	122
W-6-1	5	0	1	1	1	5	13
W-6-2	1	60	1	1	5	1	69
W-6-3	1	0	5	0	1	1	8
W-6-4	5	0	1	0	1	1	8
W-7-1	1	60	1	0	1	1	64
W-7-2	1	40	10	0	1	1	53
W-7-3	1	5	1	0	1	1	9
W-7-4	1	1	50	1	5	1	59
W-8-1	1	0	0	0	1	1	3
W-8-2	10	0	0	0	1	1	12
W-8-3	1	0	0	0	1	1	3
W-8-4	1	0	0	0	1	1	3
W-9-1	19	0	0	0	0	9	28
W-9-2	1	0	1	0	1	1	4
W-9-3	1	0	1	0	1	1	4
W-9-4	18	0	0	0	1	5	24
W-10-1	5	15	1	0	0	1	22
W-10-2	5	5	20	15	0	10	55
W-10-3	5	30	15	1	1	1	53
W-10-4	20	10	1	0	1	10	42
Total	144	484	294	175	124	96	1317
Avg/plot	14.4	48.4	29.4	17.5	12.4	9.6	131.7

	moss (%cover)	ferns (%cover)	herbs (%cover)	shrubs (%cover)	seedlings (%cover)	lichen (%cover)	T (%c
E-1-1	15	1	30	1	5	1	
E-1-2	1	0	5	0	5	1	
E-1-3	1	0	1	1	5	1	
E-1-4	10	1	15	0	10	1	
E-2-1	5	1	1	0	1	1	
E-2-2	1	0	1	0	5	1	
E-2-3	5	1	5	1	5	1	
E-2-4	5	1	10	1	5	1	
E-3-1	5	1	1	0	1	1	
E-3-2	1	1	30	1	1	1	
E-3-3	5	0	1	20	1	1	
E-3-4	1	0	1	0	15	1	
E-4-1	1	0	0	0	1	1	
E-4-2	1	0	20	1	5	1	
E-4-3	1	0	1	1	1	1	
E-4-4	10	0	0	0	1	1	
E-5-1	1	0	1	0	1	1	
E-5-2	1	0	1	0	1	5	
E-5-3	5	0	1	0	1	1	
E-5-4	1	1	1	1	10	1	
E-6-1	40	35	1	0	1	1	
E-6-2	5	30	15	0	1	1	
E-6-3	5	60	1	1	1	1	
E-6-4	1	5	10	0	1	1	
E-7-1	15	35	1	1	5	5	
E-7-2	5	5	1	1	5	1	
E-7-3	5	20	15	0	1	1	
E-7-4	5	5	1	0	1	1	
E-8-1	1	1	1	1	5	1	
E-8-2	1	1	5	1	5	1	
E-8-3	5	1	1	1	1	1	
E-8-4	5	10	45	1	1	1	
E-9-1	1	5	10	0	1	1	
E-9-2	1	0	0	0	1	1	
E-9-3	5	30	1	0	1	1	
E-9-4	1	20	15	0	5	1	
E-10-1	1	45	5	10	1	1	
E-10-2	1	40	25	1	5	1	
E-10-3	10	35	5	0	0	1	
E-10-4	5	30	1	0	1	5	
Total	194	421	285	46	123	52	1
Avg/plot	19.4	42.1	28.5	4.6	12.3	5.2	1

Table A-6. (cont.) Forest Mensuration Indicator: percent cover of understory plant categories within the 2.07-m (12-ft) radius microplots at BBWM in 1997

	moss (%cover)	ferns (%cover)	herbs (%cover)	shrubs (%cover)	seedlings (%cover)	lichen (%cover)	Total (%cover)
A-1-1	1	0	20	5	5	1	32
A-1-2	1	0	1	0	1	1	4
A-1-3	1	1	1	1	25	1	30
A-1-4	1	1	5	1	5	1	14
A-2-1	5	0	1	0	1	1	8
A-2-2	25	0	0	0	1	1	27
A-2-3	10	0	1	0	1	5	17
A-2-4	1	0	35	0	1	1	38
A-3-1	1	0	0	0	1	1	3
A-3-2	1	0	0	0	1	1	3
A-3-3	40	1	0	0	1	5	47
A-3-4	15	0	0	0	0	1	16
A-4-1	10	35	1	0	1	1	48
A-4-2	1	0	1	0	1	1	4
A-4-3	5	1	50	0	1	10	67
A-4-4	5	60	0	1	1	1	68
A-5-1	1	25	1	0	10	1	38
A-5-2	5	1	25	0	10	1	42
A-5-3	1	40	10	1	1	5	58
A-5-4	1	70	20	1	10	1	103
Y-1-1	10	0	30	1	10	1	52
Y-1-2	1	0	1	10	5	1	18
Y-1-3	1	0	5	0	1	1	8
Y-1-4	5	0	15	1	10	1	32
Y-2-1	10	10	0	0	1	1	22
Y-2-2	1	1	1	0	25	1	29
Y-2-3	1	5	1	1	25	1	34
Y-2-4	1	65	10	20	1	1	98
Y-3-1	5	60	1	0	1	1	68
Y-3-2	10	40	5	1	1	1	58
Y-3-3	1	5	0	0	1	5	12
Y-3-4	20	35	1	0	1	1	58
Y-4-1	1	0	20	1	10	1	33
Y-4-2	1	1	20	1	10	1	34
Y-4-3	20	1	0	0	1	10	32
Y-4-4	15	0	0	0	1	5	21
Y-5-1	5	10	1	0	1	1	18
Y-5-2	30	35	5	0	1	5	76
Y-5-3	1	25	40	1	1	1	69
Y-5-4	1	0	0	0	1	1	3
Total	271	528	328	47	186	82	1442
Avg/plot	27.1	52.8	32.8	4.7	18.6	8.2	144.2

Table A-7. Site tree mensuration, crown, and damage indicator raw data from Bear Brook Watershed in Maine in 1997

Watershed & Plot # & Subplot #	Tree #	Tree Species	Basal Area	Tree Age	Mensuration Indicator: Height (m)	Horizon. Dist.(m)	Azimuth (deg.)	dbh (cm)	Current Tree History	Current Cond. Class	Crown Indiactor: Crown Class	Live Crown Ratio	Crown Vigor	Crown Density	Crown Dieback	Foliar Trans.	Crown Width	Crow Widt
W 1 1	1	371	60		29.5	18.0	62	21.8	01		3	55	1	45	05	55	11	3.1
W 1 3	1	318	75		27.0	8.1	28	14.4	01		3	45	1	70	05	40	5	3.9
W 1 1	1	371	60		11.6	18.0	62	21.0			3	35		65	00	55	8.1	6
W 2 1	1	318	105		21.6	11.4	340	52.0			3	55		70	few	45	9.1	8.4
W 5 2	1	531	120		26.5	12.5	75.0	14.9	01		3	65	1	60	05	50	7.2	6.5
W 7 1	1	318	60		14.6	17.6	15	20.0			3	40		70	00	45	6.7	6.5
W 8 1	1	97	420		21.0	13.2	324	19.8	01		3	30	1	60	05	50	2.4	2.3
W 9 1	1	97	195		28.0	8.5	312	37.4	01		3	60	1	50	05	50	6.6	5.3
W 9 1	1	97	90		21.0	8.5	312	38.0			3	60		80	00	35	5.4	5.1
W 10 1	1	97	165		16.5	12.5	213	24.8	01		3	65	1	55	05	35	4.5	4.2
W 10 1	1	97	90		14.5	12.5	213	25.0			3	55		75	00	30	5.2	4.4
E 1 1	1	316	150		23.0	11.8	85	48.8	01		3	30	1	45	05	65	11	7.6
E 1 4	1	316		65		9.2	66	42.1			3						9.4	4.9
E 2 4	1	316	135		24.0	11.2	132	18.6	01		3	35	1	65	05	35	4.4	4
E 2 1	1	97		52		11.8	102	33.5			3						2.7	2.6
E 3 1	1	371	120		26.5	13.9	335	15.9	01		3	45	1	75	05	40	4	3.1
E 3 1	1	371	105		20.0	10.5	43	21.0	01		3					45	6.2	5.1
E 4 3	1	318	150		25.0	18.4	238	16.8	01		3	60	1	50	05	45	5.8	3.9
E 4 1	1	97	210		28.0	13.3	117	15.9	01		3	45	1	70	05	35	3.8	3.3
E 4 1	1	97	60		18.0	16.3	193	36.5									6.7	6.4
E 6 1	1	97	165		14.0	12.2	65	26.0			3					40	4.2	4.1
E 8 1	1	531	105		16.0	7.9	92	24.0			3	45		60	some	75	7.3	4.8
E 9 4	1	318	75		16.8	15.9	111	26.8			3	45		65	10	45	7.4	6.5
E 10 1	1	318	105		11.3	8.1	115	16.0			3	40		90	00	35	4	3.5
A 2 1	1	531	90		20.5	17.6	138	13.9	01		3	70	1	55	05	55	6.3	6
Y 5 1	1	371	150		20.5	12.0	321	44.7	01		3	50	1	45	05	55	7.2	5.5
Y 5 2	1	97	195		26.5	8.3	190	42.1	01		3	70	1	60	05	45	8.2	6.9

Table A-8. Forest-types and stand sizes recorded, by subplot, at Bear Brook Watershed in Maine in 1997

0810=maple/beech/birch
0840=red maple/northern hardwoods
0190=red spruce
0130=red spruce/balsam fir

stand size 1=sawtimber
stand size 2=poletimber

Plot #	Forest-type	Stand size	Plot #	Forest-type	Stand size	Plot #	Forest-type	Stand size
W-1-1	0810	2	E-1-1	0840	1	A-1-1	0810	2
W-1-2	0840	2	E-1-2	0810	2	A-1-2	0810	2
W-1-3	0810	2	E-1-3	0810	2	A-1-3	0810	1
W-1-4	0810	2	E-1-4	0840	1	A-1-4	0840	2
W-2-1	0810	1	E-2-1	0810	1	A-2-1	0190	2
W-2-2	0810	1	E-2-2	0810	2	A-2-2	0190	1
W-2-3	0810	2	E-2-3	0810	2	A-2-3	0190	2
W-2-4	0810	2	E-2-4	0810	2	A-2-4	0810	1
W-3-1	0810	2	E-3-1	0810	2	A-3-1	0190	1
W-3-2	0810	2	E-3-2	0190	1	A-3-2	0130	2
W-3-3	0810	2	E-3-3	0810	2	A-3-3	0130	2
W-3-4	0810	2	E-3-4	0810	2	A-3-4	0130	2
W-4-1	0810	2	E-4-1	0190	1	A-4-1	0130	2
W-4-2	0810	2	E-4-2	0840	2	A-4-2	0190	2
W-4-3	0810	2	E-4-3	0810	2	A-4-3	0190	2
W-4-4	0810	2	E-4-4	0130	2	A-4-4	0190	2
W-5-1	0810	2	E-5-1	0840	2	A-5-1	0810	2
W-5-2	0810	2	E-5-2	0840	1	A-5-2	0810	1
W-5-3	0810	2	E-5-3	0840	2	A-5-3	0810	2
W-5-4	0810	2	E-5-4	0190	2	A-5-4	0810	2
W-6-1	0190	1	E-6-1	0810	2	Y-1-1	0810	2
W-6-2	0810	2	E-6-2	0190	1	Y-1-2	0810	2
W-6-3	0190	2	E-6-3	0190	2	Y-1-3	0810	2
W-6-4	0190	1	E-6-4	0840	2	Y-1-4	0810	2
W-7-1	0810	2	E-7-1	0840	2	Y-2-1	0190	2
W-7-2	0810	2	E-7-2	0810	1	Y-2-2	0190	2
W-7-3	0810	2	E-7-3	0810	2	Y-2-3	0840	2
W-7-4	0810	2	E-7-4	0190	2	Y-2-4	0190	2
W-8-1	0190	1	E-8-1	0810	2	Y-3-1	0190	2
W-8-2	0190	2	E-8-2	0810	2	Y-3-2	0840	2
W-8-3	0190	2	E-8-3	0810	2	Y-3-3	0190	1
W-8-4	0190	2	E-8-4	0810	2	Y-3-4	0190	2
W-9-1	0190	2	E-9-1	0810	2	Y-4-1	0190	2
W-9-2	0190	1	E-9-2	0810	2	Y-4-2	0810	2
W-9-3	0190	1	E-9-3	0810	2	Y-4-3	0840	1
W-9-4	0190	2	E-9-4	0810	2	Y-4-4	0190	2
W-10-1	0190	2	E-10-1	0810	2	Y-5-1	0190	1
W-10-2	0810	2	E-10-2	0840	2	Y-5-2	0190	2
W-10-3	0840	2	E-10-3	0840	2	Y-5-3	0840	2
W-10-4	0810	2	E-10-4	0810	2	Y-5-4	0190	2

Table A-9 Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	2	0	0	0	0	0	0	0	2	0	0	0
Dominant microhabitat	6	6	4	6	6	6	6	6	6	6	6	6
Plot number W-1	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	2	0	0	0	0	0	3	1	0	trace	0
Aster spp.	4	0	0	0	1	0	1	0	0	0	0	0
Maianthemum canadense	0	0	0	0	3	0	0	0	0	0	0	0
Prenanthes alba	0	0	0	0	0	0	0	trace	0	0	0	0
Trientalis borealis	0	1	0	0	2	0	0	0	0	trace	0	0
Uvularia sessilifolia	40	8	0	0	0	0	0	2	6	0	4	3
Dryopteris campyloptera	35	36	11	0	0	0	0	17	5	23	4	15
Gymnocarpium dryopteris	0	0	0	0	0	0	7	16	0	0	0	0
Rubus spp.	0	25	0	0	0	0	0	0	0	0	0	0
Viburnum alnifolium	0	trace	18	0	0	0	0	0	23	0	4	10
unknown cotelyden	0	0	2	0	0	0	0	0	rare	0	0	0
Abies balsamea	0	0	0	0	3	rare	0	0	0	0	0	0
Acer pensylvanicum	0	18	2	1	9	rare	9	6	5	4	3	0
Acer rubrum	0	0	0	0	1	0	rare	0	0	0	0	0
Acer saccharum	12	7	8	0	1	0	15	30	2	0	0	29
Betula alleghaniensis	0	10	0	trace	0	trace	trace	rare	rare	3	0	0
Betula populifolia	0	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	4	2	0	17	9	12	0	0	3	0	0	0
Picea rubens	0	0	0	0	0	trace	rare	0	0	10	0	0
snag	0	0	0	0	0	0	0	0	0	13	1	10
rock (bare & exposed)	0	0	5	0	0	0	0	0	0	0	0	0
bare ground/ litter	25	30	45	80	60	85	65	40	55	45	80	40
moss	0	trace	18	0	9	trace	trace	1	trace	4	trace	trace
lichens	trace	trace	3	trace	3	trace	trace	trace	trace	4	trace	trace
mushrooms	0	0	0	0	0	0	1	0	trace	0	0	0
tree stump	0	0	0	0	2	0	0	0	0	0	0	0
downed log (> 10 cm)	14	0	0	0	0	0	0	5	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Viburnum alnifolium	0	0	0	0	0	0	0	0	28	0	0	0
Acer pensylvanicum	0	0	0	0	0	0	0	0	0	37	0	0
Acer saccharum	30	5	0	0	0	0	0	30	0	0	0	0
Betula alleghaniensis	2	0	0	0	0	0	0	0	0	1	0	0
Fagus grandifolia	25	4	0	15	22	30	6	0	0	0	1	7
Fraxinus americana	10	6	0	0	0	0	0	0	0	0	0	0
snag	0	0	0	0	0	0	0	0	0	2(315)	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Fagus grandifolia	65	55	16	45	0	50	34	1	0	0	55	4
Fraxinus americana	25	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	6	23	0	0	0	0	0	0	0
snag	0	0	0	0	0	0	0	0	0	2(315)	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Abies balsamea	0	0	0	70	0	0	0	0	0	0	0	0
Acer pensylvanicum	0	40	0	4	0	0	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	50	0	45	0	0	0	0
Acer saccharum	0	0	0	0	0	0	0	0	35	95	75	15
Betula alleghaniensis	0	0	85	0	0	5	30	0	80	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number W-2	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	4	0	0	0	6	0	0	0	0	0	0
Aster spp.	0	17	0	1	0	0	0	3	14	0	0	0
Maianthemum canadense	0	0	0	0	0	0	1	10	0	1	0	5
Medeola virginiana	0	5	0	0	0	0	0	0	0	0	0	0
Trientalis borealis	0	0	2	trace	0	2	0	1	0	0	0	6
Uvularia sessilifolia	55	0	trace	18	0	11	0	5	0	0	0	0
Viola spp.	0	0	0	trace	0	0	0	0	trace	1	rare	0
grass spp.	0	0	0	1	0	0	0	0	0	0	0	0
Dryopteris campyloptera	0	0	0	12	0	8	12	0	0	2	0	0
Gymnocarpium dryopteris	7	0	16	12	17	7	0	0	0	0	0	0
Thelypteris noveboracensis	0	0	0	0	12	37	0	0	0	0	0	0
Lonicera canadensis	0	0	0	0	0	0	5	0	0	0	0	0
Viburnum acerifolium	0	0	0	1	trace	3	trace	1	rare	0	0	0
Viburnum alnifolium	0	0	0	0	0	11	0	0	0	48	2	0
unknown cotelyden	0	0	rare	0	0	0	0	rare	0	rare	0	rare
Acer pensylvanicum	25	30	37	5	17	1	2	1	2	0	12	8
Acer rubrum	0	0	0	0	0	2	0	0	1	0	0	0
Acer saccharum	20	50	18	40	48	26	1	6	7	16	14	50
Betula alleghaniensis	0	0	0	0	5	trace	1	6	trace	0	0	rare
Fagus grandifolia	0	0	23	1	2	2	0	0	4	0	5	9
Picea rubens	0	rare	0	0	0	0	1	rare	0	0	rare	0
bare ground/ litter	20	13	6	15	12	28	60	65	60	30	65	15
moss	0	0	0	7	trace	0	5	trace	0	1	trace	2
lichens	trace	3	1	1	trace	2	8	trace	0	trace	trace	6
downed log (> 10 cm)	0	17	0	9	0	0	0	0	0	0	0	18
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Osmunda claytoniana	0	0	0	5	0	0	0	0	0	0	0	0
Cornus alternifolia	0	0	0	0	0	0	24	0	0	0	0	0
Viburnum alnifolium	0	0	0	0	0	0	0	0	0	24	0	0
Acer pensylvanicum	2	2	25	0	24	0	0	0	0	0	0	3
Acer saccharum	3	0	0	18	10	16	0	0	0	12	0	30
Betula alleghaniensis	0	0	0	30	0	0	0	5	0	0	0	0
Fagus grandifolia	0	0	35	0	5	2	0	4	24	0	0	35
dead red spruce branches	9	0	0	0	0	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Betula alleghaniensis	0	0	0	5	0	0	0	0	0	0	0	0
Fagus grandifolia	0	0	5	0	19	34	0	30	35	24	15	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer saccharum	90	67	80	0	0	0	0	70	0	0	0	0
Betula alleghaniensis	0	0	0	0	0	0	0	0	0	0	0	76
Fagus grandifolia	0	25	45	85	76	60	25	80	49	60	60	10
Picea rubens	0	0	0	0	0	0	0	25	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number W-3	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	0	0	0	0	0	trace	0	0	0	0	0
Aster spp.	0	0	0	0	0	1	0	0	0	0	0	40
Maianthemum canadense	0	0	0	0	0	0	0	0	0	11	0	0
Trientalis borealis	0	0	0	0	10	0	0	0	0	0	1	trace
Uvularia sessilifolia	0	0	0	0	7	0	0	1	0	0	0	0
carex spp.	0	0	0	0	0	0	0	0	0	0	0	2
Dryopteris campyloptera	0	0	0	0	0	0	2	0	0	0	0	0
Gymnocarpium dryopteris	0	0	0	0	0	0	0	0	0	0	0	30
Polystichum acrostichoides	0	0	0	0	0	0	0	0	0	0	0	1
Rubus spp.	0	0	0	0	0	0	0	0	trace	0	0	0
Viburnum alnifolium	0	0	0	0	0	60	21	0	0	0	24	0
Acer pensylvanicum	trace	0	trace	25	26	35	25	1	trace	12	4	2
Acer rubrum	0	0	0	trace	0	0	0	0	0	0	0	0
Acer saccharum	0	0	0	0	1	24	0	0	0	0	1	13
Betula alleghaniensis	2	trace	trace	0	0	0	1	0	0	30	rare	3
Fagus grandifolia	1	8	0	8	6	0	5	0	15	trace	6	2
Picea rubens	trace	rare	rare	0	0	0	rare	0	0	rare	0	rare
Prunus serotina	0	0	0	0	trace	0	0	0	0	0	0	0
snag	0	0	0	0	0	10(531)	16(315)	21(531)	0	0	0	0
bare ground/ litter	90	85	95	60	45	2	30	45	80	50	40	15
moss	4	trace	1	4	1	1	3	3	rare	trace	5	2
lichens	1	trace	2	trace	trace	trace	11	3	trace	trace	5	trace
downed log (> 10 cm)	0	0	0	0	0	0	0	26(097)	0	0	10	0
animal droppings	0	0	0	0	0	0	0	0	0	0	4	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Viburnum alnifolium	0	0	0	0	0	0	0	0	0	0	22	0
Acer pensylvanicum	0	0	0	3	50	4	55	0	0	0	0	0
Acer saccharum	0	0	0	0	0	0	0	0	0	0	0	3
Fagus grandifolia	0	24	0	2	0	15	5	0	25	30	45	0
snag	0	0	0	0	0	8(531)	19(315)	20(531)	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	15	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer pensylvanicum	0	0	0	0	0	0	20	0	0	0	0	0
Fagus grandifolia	40	50	8	40	0	10	45	0	70	0	45	40
Picea rubens	0	0	5	0	0	0	0	0	0	0	0	0
snag	0	0	0	0	0	8(531)	0	19(531)	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer saccharum	0	0	40	0	0	0	0	0	0	0	0	10
Fagus grandifolia	75	55	50	80	65	30	60	60	60	0	60	60
Picea rubens	15	25	55	0	25	0	0	0	0	95	0	0
snag	0	0	0	0	0	15(531)	0	0	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number W-4	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	16	0	0	0	0	0	25	0	0	30	0
Aster spp.	0	3	0	0	0	0	0	40	0	0	0	0
Coptis trifoliata	0	0	0	0	0	0	0	1	0	0	0	0
Polygonatum pubescens	0	0	0	0	0	0	0	0	0	0	2	0
Polygonum convolvulus	rare	0	0	0	0	0	0	0	0	0	0	0
Trientalis borealis	0	1	0	0	0	0	4	0	0	trace	3	2
Uvularia sessilifolia	0	0	6	0	0	0	0	76	0	0	0	1
Viola spp.	trace	1	0	0	0	0	0	0	0	0	0	0
grass spp.	2	0	0	1	0	0	1	0	0	0	trace	trace
Dryopteris campyloptera	0	0	0	0	0	0	6	0	0	0	4	35
Gymnocarpium dryopteris	0	0	0	0	0	0	70	0	0	0	0	0
Thelypteris phegopteris	0	0	0	0	0	0	0	0	0	0	4	0
Rubus spp.	0	0	0	30	0	0	0	5	0	0	3	0
Viburnum alnifolium	0	0	0	0	0	0	4	0	0	65	0	0
unknown cotelyden	0	0	0	0	0	0	0	rare	0	0	0	0
Acer pensylvanicum	18	35	3	3	4	2	trace	1	10	8	2	10
Acer rubrum	0	0	0	0	0	0	0	0	0	0	5	9
Acer saccharum	40	24	16	0	0	0	5	18	7	1	0	10
Betula alleghaniensis	3	2	trace	0	trace	trace	0	trace	3	trace	40	0
Fagus grandifolia	7	4	21	28	1	3	6	2	2	0	0	15
Picea rubens	trace	0	0	trace	0	rare	0	0	10	0	2	0
bare ground/ litter	25	20	55	40	90	90	12	8	70	24	15	20
moss	3	trace	1	2	1	trace	0	0	trace	1	1	5
lichens	1	1	trace	trace	rare	rare	trace	1	trace	trace	2	4
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Viburnum alnifolium	0	0	0	0	0	0	0	0	0	30	0	0
Acer pensylvanicum	6	45	0	0	0	0	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	0	0	0	0	0	15
Acer saccharum	8	0	0	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	0	8	0	0	0	0	0	0	0	0	35	0
Fagus grandifolia	0	0	40	35	0	25	0	4	0	0	0	25
dead red spruce branches	0	0	0	0	0	0	20	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Fagus grandifolia	20	3	40	35	10	55	25	45	25	0	30	25
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	0	0	0	0	0	0	0	0	0	25	0
Acer saccharum	0	85	0	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	0	0	0	0	60	80	0	0	0	0	0	0
Fagus grandifolia	85	0	80	75	15	20	90	65	60	0	0	85
Picea rubens	0	0	0	0	0	0	0	0	0	60	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number W-5	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	0	0	0	0	0	0	0	0	10	trace	30
Aster spp.	2	0	0	0	18	0	0	0	0	0	0	0
Maianthemum canadense	0	0	0	0	0	0	trace	0	0	0	7	0
Polygonatum pubescens	0	0	0	0	0	0	0	0	0	1	0	0
Polygonum convolvulus	0	0	0	0	0	0	0	0	0	0	0	1
Trientalis borealis	0	0	0	2	0	0	0	3	0	8	7	9
Trillum erectum	0	0	0	0	0	0	15	0	0	0	0	0
Uvularia sessilifolia	26	2	7	0	1	4	23	0	24	0	0	0
grass spp.	1	0	0	trace	0	3	0	0	0	0	2	0
Dennstaedtia punctilobula	0	0	0	0	0	0	0	0	0	0	8	0
Dryopteris campyloptera	1	60	48	0	0	0	24	43	trace	32	0	70
Polystichum acrostichoides	0	0	0	0	0	0	8	0	0	0	0	0
Thelypteris noveboracensis	25	2	0	0	0	0	0	0	0	38	8	38
Thelypteris phegopteris	0	0	0	0	0	0	0	2	0	0	0	0
Rubus spp.	0	0	0	0	0	0	0	0	14	0	0	33
Viburnum alnifolium	22	0	3	0	0	0	0	0	0	20	0	0
Acer pensylvanicum	0	trace	2	2	5	24	trace	5	3	12	4	trace
Acer rubrum	0	0	0	0	0	3	0	1	0	0	1	0
Acer saccharum	1	trace	18	0	3	0	1	0	4	1	0	trace
Betula alleghaniensis	0	0	0	6	0	rare	trace	trace	0	rare	6	0
Fagus grandifolia	2	rare	0	19	19	18	16	0	3	0	4	0
Picea rubens	0	0	0	trace	0	0	0	0	0	0	trace	0
rock (bare & exposed)	0	0	0	0	0	0	5	0	0	0	0	0
bare ground/ litter	22	20	20	65	50	0	19	45	50	5	55	2
moss	0	1	0	trace	trace	45	0	1	0	0	0	0
lichens	trace	0	trace	trace	1	trace	1	1	trace	trace	trace	0
downed log (> 10 cm)	0	8	0	0	0	0	6(315)	0	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Rubus spp.	0	0	0	0	0	0	0	0	3	0	0	20
Acer pensylvanicum	0	0	0	0	10	0	0	0	0	0	0	0
Acer saccharum	4	0	17	0	0	0	0	5	0	0	2	0
Betula alleghaniensis	0	0	0	0	0	0	0	0	0	3	0	0
Fagus grandifolia	0	20	0	6	35	15	15	1	25	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer saccharum	35	0	65	0	0	0	19	20	0	0	20	0
Fagus grandifolia	0	45	0	0	45	25	5	0	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer saccharum	85	30	70	90	0	85	15	60	0	0	60	85
Betula alleghaniensis	0	0	0	0	60	0	0	0	0	0	0	0
Fagus grandifolia	0	75	0	0	50	2	15	85	15	25	2	0
Picea rubens	0	0	0	0	0	2	0	0	0	0	0	20

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number W-6	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aster spp.	0	0	0	20	25	0	0	0	0	0	0	0
Maianthemum canadense	0	0	0	0	trace	0	0	0	trace	0	0	0
Trientalis borealis	0	0	0	2	1	trace	2	0	0	0	0	0
Uvularia sessilifolia	0	0	0	2	35	20	0	0	9	0	0	0
grass spp.	0	0	0	0	0	0	0	0	trace	0	0	0
Dennstaedtia punctilobula	0	0	0	23	25	0	0	0	25	0	0	0
Thelypteris phegopteris	0	0	0	0	0	17	0	0	0	0	0	0
Acer pensylvanicum	0	0	trace	1	4	9	trace	3	1	0	0	0
Acer rubrum	0	0	0	0	0	4	0	0	rare	0	0	0
Acer saccharum	0	0	0	0	2	10	0	0	0	0	0	0
Betula alleghaniensis	0	trace	1	0	1	20	rare	trace	0	0	rare	0
Fagus grandifolia	0	0	0	0	8	0	2	0	0	0	0	0
Picea rubens	rare	0	3	0	trace	4	2	trace	0	75	4	rare
dead red spruce branches	0	0	0	0	0	0	0	0	0	0	0	2
rock (bare & exposed)	2	0	0	0	2	0	0	0	0	0	0	0
bare ground/ litter	55	85	90	45	5	15	90	85	60	10	90	80
moss	10	9	4	0	8	0	1	trace	0	10	2	15
lichens	10	1	1	2	2	trace	1	trace	trace	trace	trace	trace
tree stump	0	0	0	0	0	0	0	8	0	0	0	0
downed log (> 10 cm)	18	0	0	0	25(531)	0	0	0	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Betula alleghaniensis	0	0	0	0	0	50	0	0	0	0	0	0
Fagus grandifolia	0	0	0	0	12	0	0	0	0	0	0	0
Picea rubens	0	0	0	0	0	0	0	0	0	30	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	0	1	1	1
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Fagus grandifolia	0	0	20	50	0	55	0	0	45	0	0	0
Picea rubens	0	30	0	3	0	0	0	0	0	20	0	0
snag	0	0	0	0	0	0	0	5(531)	0	0	0	0
dead red spruce branches	2	0	0	0	2	0	0	0	0	0	7	1
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	0	0	0	0	65	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	0	0	35	0	0	0
Acer saccharum	0	0	0	45	70	0	0	0	0	0	0	0
Betula alleghaniensis	0	10	0	0	0	0	10	45	0	0	0	0
Fagus grandifolia	0	0	0	0	0	50	0	0	70	0	0	0
Picea rubens	75	60	75	18	60	0	60	40	0	90	85	60

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	2	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number W-7	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aster spp.	3	0	0	0	4	0	0	0	0	0	0	0
Polygonatum pubescens	0	0	0	0	0	0	4	0	0	0	0	0
Trientalis borealis	0	0	trace	0	0	0	2	2	rare	0	0	0
Trifolium spp.	0	0	0	0	trace	1	0	4	0	0	0	0
Uvularia sessilifolia	0	0	0	0	0	5	0	0	0	5	50	0
Viola spp.	0	0	0	0	0	0	0	1	0	0	0	0
grass spp.	1	0	trace	0	0	0	0	0	0	0	0	0
Dryopteris campyloptera	14	49	21	92	17	14	rare	0	15	4	1	0
Gymnocarpium dryopteris	6	0	0	0	0	0	0	0	0	0	0	5
Thelypteris noveboracensis	0	0	1	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	trace	0	0	0	40	rare	0	1	0	rare	1	31
Acer rubrum	0	0	0	0	0	0	0	0	24	0	0	0
Acer saccharum	2	1	0	0	0	0	1	0	0	0	1	trace
Betula alleghaniensis	trace	0	0	0	trace	0	trace	trace	5	trace	trace	0
Fagus grandifolia	0	0	2	0	0	2	0	0	0	35	0	22
Quercus rubra	0	0	0	2	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	0	0	0	0	0	0	trace	0	0
rock (bare & exposed)	0	0	0	0	0	0	0	1	0	0	0	1
bare ground/ litter	70	45	70	0	30	70	90	85	35	80	35	22
moss	1	0	0	0	1	1	1	trace	5	0	0	4
lichens	trace	0	1	0	trace	1	2	1	trace	1	1	trace
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Osmunda claytoniana	0	4	0	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	0	0	0	0	8	0	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	0	0	55	0	0	0
Acer saccharum	14	0	0	10	0	0	0	0	0	0	0	0
Fagus grandifolia	0	0	11	11	0	1	0	0	0	12	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer pensylvanicum	0	0	0	0	25	0	0	0	0	0	0	0
Acer saccharum	45	10	0	23	10	0	20	0	0	0	0	0
Fagus grandifolia	0	8	0	25	0	45	0	40	0	15	20	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	0	0	0	70	0	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	0	0	60	0	0	0
Acer saccharum	90	90	20	60	70	40	85	80	0	0	0	0
Fagus grandifolia	0	0	0	0	0	10	0	0	0	95	60	0
Picea rubens	0	0	0	0	0	0	6	0	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	2	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number W-8	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aster spp.	0	0	0	0	0	0	0	0	trace	0	0	0
Acer rubrum	0	0	0	0	0	0	0	0	0	rare	0	0
Betula alleghaniensis	0	0	0	0	rare	rare	0	rare	0	rare	0	0
Fagus grandifolia	1	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	rare	trace	7	0	0	0	1	4	trace
bare ground/ litter	93	82	90	70	82	78	80	97	58	85	95	93
moss	4	16	6	11	15	10	9	trace	12	10	1	4
lichens	1	1	1	4	1	2	trace	trace	1	rare	0	1
downed log (> 10 cm)	0	0	0	10(097)	0	0	0	0	20	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Fagus grandifolia	20	0	0	0	0	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	0	2	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Fagus grandifolia	8	0	0	0	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	0	0	0	0	0	18	0	0	0
dead red spruce branches	0	5	3	10	2	45	5	trace	0	9	10	2
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer rubrum	0	0	0	0	0	0	0	0	0	20	0	0
Fagus grandifolia	15	0	0	0	0	0	0	35	0	0	0	0
Picea rubens	30	60	55	40	85	85	85	70	65	40	49	55

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	2	6	6	6	6	6	6	6	6	6	6
Plot number W-9	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	2	3	1	2	3	1	2	3	1	2	3	
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Maianthemum canadense	0	0	0	0	0	0	0	0	0	trace	0	0
Polygonatum pubescens	0	0	0	0	0	0	2	0	0	0	0	0
grass spp.	0	0	0	0	0	rare	0	0	0	0	0	0
Acer pensylvanicum	0	0	0	0	0	0	0	0	trace	0	0	0
Betula alleghaniensis	0	0	0	trace	0	rare	1	1	rare	0	0	0
Picea rubens	0	0	0	trace	0	1	rare		1	13	6	4
Sorbus americana	0	0	0	trace	0	0	0	0	0	1	0	0
rock (bare & exposed)	3	0	2	8	0	0	0	0	0	0	0	2
bare ground/ litter	85	35	60	83	98	0	95	90	98	65	97	73
moss	6	17	19	6	1	4	0	2	trace	7	1	8
lichens	2	30	3	8	0	1	0	4	0	2	trace	4
downed log (> 10 cm)	0	0	6	0	0	10	0	0	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Fagus grandifolia	0	0	0	0	3	30	0	0	0	0	0	0
snag	0	0	0	0	0	0	0	18(097)	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	12	0	0	7
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Fagus grandifolia	0	0	0	0	15	60	8	3	0	0	0	0
Picea rubens	0	25	8	0	0	0	0	0	0	60	20	50
dead red spruce branches	4	0	0	8	0	0	0	0	18	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	0	0	0	0	22	0	0	0	0	0	0
Betula alleghaniensis	0	12	20	0	0	0	0	0	0	0	0	0
Fagus grandifolia	0	0	0	0	0	30	0	0	50	0	0	0
Picea rubens	38	10	30	95	60	15	20	85	90	83	75	45

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	7	7	6	6	6	6	6	6	6	6	2
Plot number W-10	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	2	3	1	2	3	1	2	3	1	2	3	
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Clintonia borealis	0	2	0	0	0	0	0	0	0	0	0	0
Cornus canadensis	6	0	0	0	0	0	0	0	0	0	0	0
Maianthemum canadense	1	0	0	3	0	35	10	1	trace	0	0	0
Trientalis borealis	trace	rare	0	0	1	0	3	1	1	0	0	0
Uvularia sessilifolia	1	rare	0	0	0	0	0	0	0	0	rare	0
grass spp.	6	0	0	26	6	55	0	0	1	0	0	4
Dryopteris campyloptera	65	6	0	1	41	0	8	29	18	45	40	0
Acer pensylvanicum	0	0	0	0	0	0	rare	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	rare	trace	0	0	0	0
Acer saccharum	rare	0	0	0	0	0	0	0	0	trace	trace	0
Fagus grandifolia	0	0	0	0	0	0	0	0	0	0	18	0
Picea rubens	0	30	55	2	0	1	0	0	rare	0	0	0
Prunus serotina	0	3	0	0	0	0	0	0	0	0	1	0
Sorbus americana	0	0	6	0	0	0	0	0	0	0	0	0
rock (bare & exposed)	0	0	0	1	1	0	0	0	0	0	0	0
bare ground/ litter	14	40	35	12	11	6	51	54	76	45	0	48
moss	0	1	4	1	5	trace	0	1	0	0	3	5
lichens	4	1	0	10	1	trace	trace	1	0	0	3	30
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Fagus grandifolia	0	0	0	0	0	0	0	0	0	10	0	45
Picea rubens	9	60	64	0	0	0	39	0	0	0	0	0
snag	0	0	0	0	40	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer rubrum	0	51	0	0	0	0	0	8	0	0	0	18
Betula alleghaniensis	0	0	0	39	0	0	0	0	0	0	0	0
Fagus grandifolia	11	0	0	0	0	62	65	0	0	30	45	4
Picea rubens	0	31	70	25	0	0	15	0	25	0	0	35
Prunus serotina	0	39	0	0	0	0	0	0	0	0	0	0
Sorbus americana	0	0	20	0	0	0	0	0	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	0	0	0	0	0	0	0	0	40	0	0
Acer rubrum	0	0	39	0	0	0	0	21	0	0	0	0
Betula alleghaniensis	0	0	0	10	0	0	0	60	0	0	0	0
Fagus grandifolia	3	0	0	0	0	40	70	0	0	65	55	0
Picea rubens	0	0	49	5	0	0	0	0	62	0	0	18

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	2	6	6	6	6	6	6	6	6	6	5	6
Plot number E-1	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	1	5	39	3	0	0	0	0	0	26	0	25
Aster spp.	0	0	8	16	1	1	0	1	0	0	0	0
Medeola virginiana	0	0	0	0	0	0	0	0	1	0	0	0
Trientalis borealis	0	0	0	trace	0	0	1	6	0	0	0	4
Uvularia sessilifolia	0	0	0	trace	0	0	2	0	0	0	0	0
carex spp.	0	0	0	3	0	1	0	0	0	0	0	0
Dryopteris campyloptera	6	0	0	0	0	0	4	0	0	0	0	0
Cornus alternifolia	0	0	0	7	0	0	0	trace	0	0	0	0
Viburnum acerifolium	0	trace	0	0	0	0	0	trace	0	0	0	0
Viburnum alnifolium	0	0	0	10	0	0	0	0	0	0	0	0
unknown cotelyden	0	0	0	rare	rare	rare	rare	rare	rare	0	0	0
Acer pensylvanicum	0	0	11	1	trace	rare	3	45	5	6	1	4
Acer rubrum	0	rare	39	0	0	0	trace	11	1	9	rare	15
Acer saccharum	0	0	1	4	0	rare	5	10	5	0	0	0
Betula alleghaniensis	0	25	2	1	1	5	0	9	0	0	1	6
Fagus grandifolia	16	0	2	28	0	17	4	3	1	31	0	12
Picea rubens	0	1	0	0	0	0	0	trace	rare	0	trace	1
Tsuga canadensis	0	0	0	0	70	0	24	0	0	0	0	0
snag	0	0	0	0	0	0	2(531)	0	0	0	0	10
rock (bare & exposed)	0	1	0	0	0	0	0	0	0	0	0	0
bare ground/ litter	10	45	20	35	25	70	60	30	85	45	30	25
moss	7	19	5	2	1	2	trace	3	trace	3	4	3
lichens	59	1	2	trace	trace	trace	trace	trace	trace	trace	1	3
tree stump	0	0	0	0	0	2	0	0	0	0	60(097)	8
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Cornus alternifolia	0	0	3	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	0	0	26	0	0	0	0	0	0	0	0	0
Acer rubrum	0	0	12	0	0	0	0	0	0	1	trace(1)	0
Betula alleghaniensis	10	60	11	0	0	20	0	0	0	0	0	1
Fagus grandifolia	33	0	5	12	0	25	15	0	2	45	0	6
Picea rubens	0	0	0	0	0	0	0	0	0	0	trace(6)	0
Tsuga canadensis	0	0	0	0	29	0	0	0	0	0	0	0
snag	0	0	0	0	0	0	1(531)	0	0	0	0	0
downed log (>10 cm)	0	0	0	0	0	0	0	0	0	0	70(097)	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Betula alleghaniensis	2	45	0	0	0	29	0	0	0	0	0	0
Fagus grandifolia	5	0	4	40	3	5	45	0	0	30	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	0	0	0	25	0	0	0	0	0	0	0
Acer rubrum	80	0	0	10	0	0	0	0	30	50	0	0
Acer saccharum	0	0	0	0	0	0	0	75	0	0	0	0
Betula alleghaniensis	0	25	2	35	40	75	70	0	15	0	0	0
Fagus grandifolia	0	0	35	20	25	30	20	26	50	40	0	20
Fraxinus americana	0	0	0	0	0	0	50	0	20	0	0	0
Picea rubens	0	85	0	0	0	0	0	0	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number E-2	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	0	0	3	0	0	49	0	5	0	0	0
Aster spp.	0	0	0	0	0	0	trace	0	0	trace	7	0
Maianthemum canadense	0	0	3	0	0	0	0	0	0	0	0	0
Trientalis borealis	0	0	0	0	0	14	trace	0	4	0	0	0
Uvularia sessilifolia	0	0	0	11	0	0	0	0	0	0	0	0
carex spp.	0	0	0	0	0	0	0	trace	0	0	trace	0
grass spp.	0	0	0	0	0	0	0	0	0	2	5	3
Dryopteris campyloptera	0	3	0	0	0	0	0	0	0	15	0	0
Thelypteris noveboracensis	0	0	0	0	0	0	0	0	0	7	0	0
Thelypteris phegopteris	0	0	0	2	0	0	0	0	0	0	0	0
Lonicera canadensis	10	0	0	0	0	0	0	0	0	0	0	0
Rubus spp.	0	0	0	0	0	0	8	1	0	trace	10	0
Viburnum alnifolium	0	0	0	0	0	0	0	0	0	0	trace	0
unknown cotelyden	rare	0	rare	0	0	rare	0	0	0	rare	rare	rare
Acer pensylvanicum	trace	trace	trace	2	0	4	0	0	7	24	0	6
Acer rubrum	0	0	0	trace	trace	3	0	1	19	0	0	trace
Acer saccharum	trace	0	0	0	0	0	2	0	trace	trace	0	0
Betula alleghaniensis	trace	14	trace	40	0	trace	15	1	9	26	6	0
Fagus grandifolia	0	0	2	0	0	0	0	1	15	0	0	1
Picea rubens	0	4	28	1	3	trace	18	40	0	0	0	rare
rock (bare & exposed)	3	0	0	0	0	0	0	5	0	0	0	0
bare ground/ litter	75	56	50	45	95	76	20	45	45	25	55	85
moss	4	19	trace	5	trace	1	4	4	1	trace	trace	1
lichens	5	5	2	trace	trace	1	1	1	1	trace	trace	trace
downed log (> 10 cm)	0	0	14(531)	0	0	0	20	0	0	0	20	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Acer pensylvanicum	0	0	0	30	0	0	0	trace	0	0	15	17
Acer rubrum	0	0	0	0	0	0	0	0	1	0	0	0
Acer saccharum	0	0	0	0	0	0	0	0	8	0	0	0
Betula alleghaniensis	0	0	0	30	0	0	40	3	25	18	20	0
Fagus grandifolia	16	0	20	trace	0	0	8	0	35	18	16	16
Fraxinus americana	0	0	0	0	0	0	0	0	5	0	0	0
Picea rubens	0	0	13	0	0	0	36	55	0	0	0	0
snag	0	0	0	9	0	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	6	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer pensylvanicum	0	0	0	30	0	0	5	0	13	0	55	25
Betula alleghaniensis	0	0	0	0	0	0	7	0	0	0	0	0
Fagus grandifolia	35	0	60	0	0	0	5	55	4	60	35	30
Fraxinus americana	0	0	0	0	0	0	0	0	35	0	0	0
Picea rubens	0	0	0	0	0	35	0	2	0	0	0	0
dead red spruce branches	0	0	0	0	5	0	0	0	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer rubrum	0	0	0	0	50	76	0	0	0	0	0	0
Acer saccharum	0	0	0	0	0	0	75	0	0	0	0	0
Betula alleghaniensis	85	20	0	10	0	45	0	0	0	0	0	0
Fagus grandifolia	45	0	60	25	0	0	0	20	76	55	55	80
Picea rubens	0	80	90	0	25	21	0	0	0	10	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6 (60%)	6	7	6	6	6	6 (80%)	6	6	6	6
Plot number E-3	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	0	0	0	0	0	19	0	0	2	0	0
Aster spp.	8	16	0	0	0	0	0	0	0	0	35	0
Coptis trifoliata	0	0	0	0	0	25	0	0	0	0	0	0
Maianthemum canadense	0	0	0	0	0	0	0	0	0	9	0	0
Trientalis borealis	0	0	0	0	trace	3	2	0	0	0	2	2
Uvularia sessilifolia	0	0	0	0	0	0	0	0	0	15	0	9
Dryopteris campyloptera	0	0	0	0	0	0	0	0	7	0	0	0
Diervilla lonicera	2	0	0	0	0	0	0	trace	0	0	0	0
Rubus spp.	2	3	0	0	0	0	0	0	11	0	0	0
unknown cotelyden	0	rare	0	0	rare	0	0	0	0	0	rare	0
Acer pensylvanicum	2	4	trace	0	trace	4	4	trace	1	30	10	18
Acer rubrum	rare	trace	0	0	0	0	rare	0	0	5	1	trace
Acer saccharum	1	1	0	0	0	0	0	0	0	9	2	25
Betula alleghaniensis	0	20	rare	82	rare	0	6	15	trace	trace	trace	0
Fagus grandifolia	0	0	trace	0	0	0	1	0	20	1	trace	trace
Fraxinus americana	0	trace	0	0	0	0	0	0	0	0	0	0
Picea rubens	0	0	8	1	2	1	2	2	0	0	5	0
snag	0	0	0	0	0	0	0	0	0	1(531)	0	0
rock (bare & exposed)	0	1	0	3	0	0	0	0	0	0	0	0
bare ground/ litter	75	40	85	35	80	65	65	70	65	35	40	50
moss	2	8	2	12	6	0	1	11	2	1	10	0
lichens	6	7	1	3	1	trace	trace	3	trace	trace	7	trace
tree stump	0	0	0	0	9	0	0	0	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Rubus spp.	0	0	0	0	0	0	0	0	2	0	0	0
Betula alleghaniensis	0	0	0	56	0	0	10	36	trace	0	0	0
Fagus grandifolia	0	0	0	0	0	0	35	0	47	15	5	0
Fraxinus americana	0	1	0	0	0	0	0	0	0	0	0	0
Picea rubens	3	0	0	0	1	25	0	0	0	0	0	0
snag	0	0	0	0	0	0	0	3(097)	0	0	0	0
dead red spruce branches	0	0	0	0	1	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer pensylvanicum	0	0	0	0	0	0	0	4	0	0	0	0
Acer saccharum	0	0	0	0	0	15	0	0	0	0	0	0
Betula alleghaniensis	0	0	3	25	0	0	0	5	0	0	0	0
Betula populifolia	0	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	2	8	0	0	0	0	45	0	20	55	48	8
Picea rubens	8	20	0	24	25	20	0	0	0	0	0	0
snag	0	0	0	0	0	0	0	1(097)	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer saccharum	0	70	0	0	0	0	0	0	0	85	70	0
Betula alleghaniensis	65	0	15	75	0	0	0	5	0	0	0	45
Fagus grandifolia	3	5	0	0	50	0	60	0	75	55	55	25
Picea rubens	60	10	75	15	25	75	0	0	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number E-4	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aster spp.	1	0	0	0	0	0	0	0	0	0	0	0
Coptis trifoliata	0	0	0	9	0	0	0	0	0	0	0	0
Lycopodium spp.	0	0	0	0	0	0	0	0	0	0	1	0
Maianthemum canadense	0	0	0	3	0	2	0	0	trace	0	0	0
Medeola virginiana	0	0	0	0	0	trace	0	0	0	0	0	0
Trientalis borealis	0	0	0	2	0	2	0	0	trace	0	0	0
Uvularia sessilifolia	0	0	0	0	0	4	0	0	40	0	0	0
carex spp.	0	0	0	9	1	0	0	1	0	0	0	0
grass spp.	0	0	rare	0	0	0	0	3	0	0	0	0
unknown cotelyden	0	0	0	0	rare	0	rare	0	rare	0	0	0
Abies balsamea	0	0	0	1	0	0	0	0	0	2	0	3
Acer pensylvanicum	trace	0	0	1	trace	1	trace	15	1	trace	0	0
Acer rubrum	0	0	0	trace	0	trace	0	0	0	0	0	0
Acer saccharum	0	0	0	0	0	0	0	0	rare	0	0	0
Betula alleghaniensis	trace	rare	1	rare	trace	0	0	0	0	0	0	0
Fagus grandifolia	0	0	1	5	0	7	2	0	2	0	0	0
Picea rubens	0	rare	5	rare	15	rare	trace	0	rare	0	0	8
snag	0	0	0	4(531)	0	0	0	0	0	0	0	0
rock (bare & exposed)	0	15	0	0	0	0	7	9	1	0	0	0
bare ground/ litter	95	75	70	65	80	83	75	50	50	95	80	80
moss	2	4	20	2	1	0	10	16	4	trace	1	2
lichens	1	6	2	1	2	trace	3	9	1	trace	1	4
downed log (> 10 cm)	0	0	0	0	0	0	20(531)	0	0	0	10(097)	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Abies balsamea	0	0	0	0	0	0	0	0	0	1	0	0
Acer rubrum	0	0	0	0	0	0	0	0	3	0	0	0
Betula alleghaniensis	0	0	1	0	0	0	0	0	0	0	0	0
Fagus grandifolia	0	0	11	16	0	0	0	0	40	0	0	0
Picea rubens	3	0	25	0	30	16	0	0	0	0	0	0
snag	0	0	0	3(531)	0	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Abies balsamea	0	0	0	0	0	0	0	0	0	9	0	5
Betula alleghaniensis	0	0	12	0	0	0	0	14	2	0	0	0
Fagus grandifolia	0	0	35	40	17	38	0	13	8	0	0	0
Picea rubens	55	0	0	0	35	8	0	0	0	0	0	9
dead red spruce branches	0	4	0	0	0	0	0	0	0	8	0	5
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Abies balsamea	0	0	0	0	0	0	0	0	0	50	65	15
Acer rubrum	0	0	0	0	0	55	0	0	0	0	20	75
Betula alleghaniensis	20	0	25	75	0	0	10	80	60	3	3	15
Fagus grandifolia	0	0	25	30	70	25	0	0	0	0	0	0
Picea rubens	4	80	0	0	30	0	0	0	0	20	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6 (70%)	6	6	6	6	6	6
Plot number E-5	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aster spp.	0	1	0	0	0	0	0	0	0	40	11	3
Trientalis borealis	0	0	0	0	0	1	0	5	0	5	0	1
Uvularia sessilifolia	0	0	4	0	0	1	0	0	0	3	20	21
grass spp.	0	0	0	0	0	0	3	0	0	1	rare	0
Dryopteris campyloptera	0	2	0	0	0	0	0	0	0	4	0	0
Osmunda claytoniana	0	0	0	0	0	0	0	0	1	0	0	0
Thelypteris phegopteris	0	0	0	0	0	0	0	0	0	2	0	0
Rubus spp.	0	0	0	0	0	0	0	0	0	0	1	0
Acer pensylvanicum	2	2	2	2	2	trace	2	1	0	5	2	1
Acer rubrum	0	trace	trace	0	rare	0	1	trace	rare	8	18	0
Betula alleghaniensis	trace	1	rare	0	1	trace	0	0	rare	16	15	1
Fagus grandifolia	0	0	rare	1	0	0	20	2	0	0	30	17
Picea rubens	8	8	trace	0	trace	0	trace	0	0	1	1	0
snag	0	0	0	0	0	30(315)	0	0	0	0	0	0
dead red spruce branches	4	0	0	0	0	0	0	0	0	0	0	0
rock (bare & exposed)	0	2	1	0	0	0	0	0	2	0	0	0
bare ground/ litter	88	65	85	95	75	55	65	90	90	16	15	50
moss	2	9	2	trace	14	7	3	trace	3	2	0	0
lichens	trace	6	1	0	3	4	trace	trace	trace	trace	trace	trace
downed log (> 10 cm)	0	0	0	0	0	0	0	0	0	0	11(097)	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Fagus grandifolia	0	0	0	0	0	0	0	1	0	0	25	0
dead red spruce branches	5	0	0	0	0	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Fagus grandifolia	10	0	10	2	0	40	7	45	30	30	40	50
Picea rubens	0	0	0	0	0	21	0	0	1	0	0	0
dead red spruce branches	10	5	0	0	6	0	0	0	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer rubrum	20	35	50	30	0	0	0	65	40	0	0	85
Fagus grandifolia	0	0	65	70	55	65	45	45	20	0	20	0
Picea rubens	60	80	0	0	30	0	5	0	10	70	15	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	5	6	6	6	6	6	6	6
Plot number E-6	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aster spp.	1	0	0	18	1	5	0	0	3	42	0	7
Maianthemum canadense	0	0	0	0	0	0	1	0	0	0	0	1
Trientalis borealis	0	0	0	0	0	0	1	0	2	0	2	5
Trillium spp.	0	0	0	0	1	0	0	0	0	0	0	0
Uvularia sessilifolia	0	0	0	0	0	0	0	0	0	11	0	0
carex spp.	0	0	0	0	0	0	0	0	1	0	0	0
grass spp.	0	0	0	0	0	0	0	0	5	0	0	0
Dryopteris campyloptera	4	0	8	4	3	0	70	0	80	13	1	65
Osmunda claytoniana	45	55	0	0	0	0	0	90	0	0	0	0
Thelypteris phegopteris	0	0	0	0	0	0	0	0	0	0	0	1
Rubus spp.	0	0	0	0	0	0	0	0	1	0	2	0
rock (bare & exposed)	0	0	0	0	0	0	0	0	2	0	0	0
bare ground/ litter	20	35	45	60	10	45	20	6	5	25	50	5
moss	1	6	28	10	1	1	trace	trace	8	2	1	trace
lichens	trace	0	4	1	trace	trace	trace	trace	6	1	trace	1
tree stump	0	0	0	0	0	0	0	0	0	0	0	16
downed log (> 10 cm)	0	0	0	0	80	0	0	0	0	0	15	0
Acer pensylvanicum	2	0	rare	rare	0	32	trace	rare	trace	1	9	trace
Acer rubrum	rare	0	0	0	0	0	trace	rare	rare	trace	4	0
Acer saccharum	0	0	0	0	2	0	0	0	0	0	11	0
Betula alleghaniensis	1	0	1	38	rare	trace	trace	2	trace	0	1	rare
Fagus grandifolia	20	0	0	0	0	14	0	0	0	0	trace	2
Picea rubens	rare	0	5	0	0	0	0	0	rare	0	1	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Osmunda claytoniana	0	95	0	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	0	0	0	16	0	0	0	0	0	0	0	0
Betula alleghaniensis	0	0	0	45	0	0	0	0	0	0	0	0
Fagus grandifolia	15	0	0	0	0	0	0	0	0	0	0	11
dead red spruce branches	20	0	0	0	0	0	15	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer pensylvanicum	0	0	0	55	0	0	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	0	10	0	0	0	0
Acer saccharum	0	0	0	0	40	35	0	0	0	0	0	40
Betula alleghaniensis	0	0	0	0	0	0	0	0	15	0	0	0
Fagus grandifolia	12	0	0	0	0	0	0	0	0	55	50	0
Picea rubens	0	0	35	0	0	0	0	0	0	0	0	0
snag	0	0	0	0	0	0	30(097)	0	0	0	0	0
dead red spruce branches	20	0	0	0	0	0	0	0	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer rubrum	0	0	0	0	0	0	15	0	0	45	0	0
Acer saccharum	0	0	0	0	80	65	0	0	0	0	35	76
Betula alleghaniensis	65	0	55	0	40	0	0	51	49	0	0	0
Fagus grandifolia	0	0	0	0	0	20	0	0	0	75	75	0
Picea rubens	0	20	75	65	0	0	0	30	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6 (80%)	6	6	6	6	6 (60%)	6	2	2 (70%)
Plot number E-7	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aster spp.	20	0	0	0	0	0	4	11	11	0	0	0
Maianthemum canadense	0	0	0	0	0	0	0	2	0	0	0	0
Medeola virginiana	22	0	0	0	0	0	0	0	0	0	0	0
Polygonum convolvulus	0	0	0	0	0	rare	0	0	0	0	0	0
Trientalis borealis	1	3	2	2	0	0	0	0	2	0	0	0
Uvularia sessilifolia	trace	0	0	0	0	0	0	5	0	0	0	0
Viola spp.	0	0	0	1	0	0	0	0	0	0	0	0
grass spp.	0	0	0	trace	0	0	0	10	0	0	0	0
Dryopteris campyloptera	1	55	20	4	6	20	33	23	8	7	0	38
Lonicera canadensis	2	0	7	0	0	0	0	0	0	0	0	0
Ribes glandulosum	0	0	0	0	0	0	0	0	0	0	0	19
Rubus spp.	0	0	0	1	0	0	0	0	0	0	0	0
Acer pensylvanicum	4	1	1	13	rare	0	3	4	3	0	0	0
Acer rubrum	rare	0	0	0	0	2	0	0	0	trace	0	0
Acer saccharum	0	0	0	0	0	0	0	trace	0	0	0	0
Betula alleghaniensis	0	1	0	2	trace	trace	0	1	18	rare	rare	7
Fagus grandifolia	1	0	35	6	0	7	0	0	0	0	0	0
Picea rubens	trace	0	0	rare	rare	trace	0	9	0	trace	0	0
rock (bare & exposed)	0	1	0	1	0	2	0	0	0	1	58	65
bare ground/ litter	45	35	0	51	58	56	55	25	20	87	26	20
moss	0	2	0	18	23	7	1	2	1	2	14	33
lichens	trace	0	0	0	2	2	0	trace	5	1	45	6
tree stump	0	0	0	0	0	0	0	0	40	0	0	0
downed log (> 10 cm)	0	0	15(531)	20	0	0	0	0	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Acer saccharum	0	0	0	0	0	9	0	0	0	0	0	0
Betula alleghaniensis	0	0	0	0	0	0	0	0	0	0	0	28
Fagus grandifolia	0	2	30	3	0	0	15	25	3	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	0	0	8	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer saccharum	0	0	0	0	0	40	0	0	0	0	0	0
Fagus grandifolia	26	2	5	32	0	0	0	45	5	0	0	0
Picea rubens	0	0	0	0	0	0	0	0	0	0	0	25
dead red spruce branches	0	0	0	0	0	0	0	0	0	0	5	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer rubrum	65	0	0	0	0	0	0	0	0	0	0	0
Acer saccharum	0	0	0	0	0	90	0	0	35	0	0	0
Fagus grandifolia	15	60	0	60	75	25	65	20	0	0	0	10
Picea rubens	0	40	0	0	0	0	0	60	15	20	90	15

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	2	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	7	6
Plot number E-8	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	0	0	0	0	0	0	9	16	34	20	0
Aster spp.	0	20	0	0	0	0	0	2	2	trace	0	1
Maianthemum canadense	4	2	0	2	5	trace	trace	2	1	0	5	5
Trientalis borealis	trace	3	1	3	rare	0	trace	0	0	2	2	7
carex spp.	2	3	0	7	0	0	1	1	trace	1	0	trace
Dryopteris campyloptera	0	38	0	0	0	0	0	0	0	4	5	53
Gymnocarpium dryopteris	0	0	0	0	0	0	0	0	0	0	2	14
Thelypteris phegopteris	0	0	0	0	3	0	0	0	0	3	0	0
Lonicera canadensis	0	0	0	0	0	0	0	0	0	trace	0	0
Rubus spp.	0	0	0	0	0	0	0	0	1	0	1	0
Viburnum alnifolium	0	0	0	0	0	0	0	0	8	0	0	0
Abies balsamea	0	0	0	0	14	0	0	0	0	0	0	0
Acer pensylvanicum	2	1	trace	1	trace	0	1	trace	4	trace	trace	trace
Acer rubrum	0	5	0	0	0	0	1	0	1	0	7	0
Acer saccharum	1	trace	1	5	0	0	trace	trace	22	0	0	0
Betula alleghaniensis	1	0	4	1	0	trace	10	0	rare	28	0	rare
Fagus grandifolia	7	1	5	0	0	1	45	25	7	0	75	18
Picea rubens	15	0	0	0	9	0	0	rare	0	0	0	0
Prunus virginiana	0	0	0	0	0	0	0	2	0	0	0	0
Sorbus americana	0	0	0	rare	0	0	0	0	0	0	0	0
snag	1(531)	0	0	0	0	8	0	0	0	0	0	0
rock (bare & exposed)	0	0	0	0	0	0	0	4	0	0	0	0
bare ground/ litter	60	20	85	70	60	78	30	40	20	18	0	6
moss	trace	3	1	9	4	10	2	9	3	6	10	1
lichens	1	1	trace	1	1	1	trace	1	trace	1	4	1
downed log (> 10 cm)	0	0	0	0	0	0	0	0	7	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Abies balsamea	0	0	0	0	0	5	0	0	0	0	0	0
Acer pensylvanicum	2	trace	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	5	0	35	10	0	3	30	40	35	60	35	30
Picea rubens	28	0	0	0	0	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer saccharum	0	0	0	15	0	0	0	0	0	0	0	0
Fagus grandifolia	40	18	30	0	0	25	18	55	25	65	40	40
Picea rubens	0	0	0	0	20	0	0	0	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	0	0	0	0	30	0	0	0	0	0	0
Acer saccharum	0	15	0	5	0	0	0	0	0	0	0	0
Betula alleghaniensis	0	0	0	55	0	0	0	0	0	0	0	0
Fagus grandifolia	40	28	60	55	0	15	65	80	65	0	55	25
Picea rubens	0	0	0	0	90	25	0	0	0	20	25	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6 (65%)	6	6	6	6	6	6
Plot number E-9	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	0	0	5	0	0	0	0	0	0	0	0
Arisaema triphyllum	0	0	0	2	0	rare	0	0	0	0	0	0
Aster spp.	0	4	0	16	0	0	0	trace	2	0	0	1
Maianthemum canadense	0	0	0	0	0	0	0	0	4	0	0	0
Polygonum convolvulus	0	0	0	0	0	0	0	0	0	1	0	0
Trientalis borealis	1	0	0	0	0	0	0	0	0	1	4	2
Uvularia sessilifolia	12	6	0	0	0	0	trace	0	1	52	0	0
carex spp.	0	0	0	0	0	0	0	0	0	3	0	0
grass spp.	4	4	0	0	trace	0	1	trace	0	0	0	0
Dennstaedtia punctilobula	0	0	0	5	0	0	0	0	0	0	0	0
Dryopteris campyloptera	16	75	51	0	0	17	60	72	0	48	75	16
Thelypteris phegopteris	0	0	0	5	0	0	0	0	0	0	0	0
Ribes glandulosum	0	0	0	0	0	0	0	6	0	0	0	0
Acer pensylvanicum	trace	trace	trace	3	trace	0	0	2	0	19	0	0
Acer saccharum	0	0	0	1	0	0	0	0	0	3	3	7
Betula alleghaniensis	0	0	0	6	trace	0	0	rare	0	0	trace	0
Fagus grandifolia	26	5	29	26	1	0	16	0	46	2	11	23
Prunus virginiana	0	0	0	0	0	0	3	0	0	0	0	0
rock (bare & exposed)	0	0	0	2	0	33	6	0	0	0	0	0
bare ground/ litter	40	12	20	28	96	38	8	3	40	4	18	28
moss	3	1	0	1	1	11	26	16	4	0	0	2
lichens	8	1	trace	trace	1	9	4	1	trace	trace	trace	1
downed log (> 10 cm)	0	0	0	0	0	35(531)	0	0	0	0	0	14(097)
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Fagus grandifolia	49	6	6	1	2	5	25	0	35	5	0	45
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer saccharum	0	15	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	0	15	0	0	18	60	20	60	25	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer saccharum	0	40	0	0	0	0	0	0	0	20	0	0
Fagus grandifolia	25	70	85	49	55	30	5	65	75	20	48	35
Picea rubens	0	0	0	0	10	60	0	0	0	0	0	20

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	2	6	6	6	5	6	6	6	6	6	6	6
Plot number E-10	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aster spp.	0	9	0	0	0	0	trace	3	0	0	7	0
Cornus canadensis	0	0	0	0	0	0	5	28	0	0	0	0
Fragaria virginiana	0	1	4	0	0	0	0	0	0	0	0	0
Maianthemum canadense	0	0	0	0	0	15	25	22	8	trace	20	5
Polygonum convolvulus	2	0	0	0	0	0	0	0	0	0	2	0
Prenanthes alba	0	0	trace	0	0	0	0	0	0	0	0	0
Trientalis borealis	8	8	3	2	2	3	1	2	4	0	8	0
Uvularia sessilifolia	2	45	1	30	0	0	0	8	0	0	0	0
grass spp.	0	6	7	2	0	0	6	15	0	0	10	0
Dryopteris campyloptera	5	20	10	35	0	76	4	24	75	94	1	16
Vaccinium spp.	0	0	0	0	0	0	4	0	0	0	0	0
Acer pensylvanicum	0	0	0	0	1	2	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	0	trace	0	1	0	0
Acer saccharum	3	4	43	1	1	0	0	0	0	0	0	0
Picea rubens	0	0	0	trace	0	0	0	0	0	0	0	0
Sorbus americana	0	5	0	0	0	0	0	0	0	0	0	0
snag	0	0	0	0	35	0	0	0	0	0	0	0
rock (bare & exposed)	3	0	4	0	0	0	0	0	0	0	0	0
bare ground/ litter	25	6	14	5	55	8	30	4	0	0	28	80
moss	16	0	5	1	35	0	0	3	0	7	3	0
lichens	6	2	3	1	4	2	3	0	0	3	2	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Acer rubrum	0	0	0	0	3	0	0	0	0	0	0	0
Acer saccharum	18	0	20	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	0	0	0	0	0	0	0	0	3	0	0	0
Fagus grandifolia	0	0	25	0	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	0	0	0	0	5	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	0	0	4	20
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer rubrum	0	0	0	0	0	0	0	5	0	0	0	0
Acer saccharum	40	5	70	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	0	0	0	0	0	0	0	0	0	30	0	0
Fagus grandifolia	0	0	15	0	0	12	0	0	0	0	0	0
Picea rubens	0	0	0	0	0	5	0	10	0	5	0	8
Sorbus americana	0	0	0	0	0	0	25	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	0	0	15	15
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer rubrum	0	0	0	0	40	0	0	5	0	0	0	35
Acer saccharum	55	20	50	0	55	62	0	0	0	0	0	0
Betula alleghaniensis	20	0	0	0	0	0	0	0	20	35	0	0
Fagus grandifolia	0	25	0	25	0	0	0	0	0	0	0	20
Picea rubens	0	0	0	0	0	0	20	10	0	0	80	0
Sorbus americana	0	0	0	0	0	0	45	0	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	2	6	6	6	6	6	6	6	6	6	6
Plot number A&Y-1	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	0	13	0	0	0	0	0	0	2	6	5
Aster spp.	0	1	0	0	0	0	0	0	0	2	12	4
Coptis trifoliata	0	0	2	0	0	0	0	0	0	0	0	0
Smilacina stellata	0	0	0	0	0	0	0	0	0	0	5	0
Trientalis borealis	0	trace	1	0	trace	0	trace	0	0	2	0	trace
Uvularia sessilifolia	0	0	rare	0	0	0	9	7	0	1	5	0
Viola spp.	0	0	0	0	0	0	2	2	0	1	1	0
carex spp.	0	0	0	trace	0	0	0	0	0	0	0	0
Dryopteris campyloptera	0	0	0	0	0	0	1	15	0	0	0	0
Lonicera canadensis	0	0	0	0	0	0	0	0	0	0	8	0
Rubus spp.	0	0	10	0	0	0	0	20	1	0	0	0
Viburnum acerifolium	0	0	0	0	0	0	trace	0	0	0	0	0
unknown cotelyden	0	0	0	0	rare	0	rare	0	0	rare	rare	rare
unknown cotelyden	rare	0	0	0	0	0	rare	rare	0	0	0	0
Acer pensylvanicum	1	0	5	1	2	1	1	0	0	3	5	1
Acer rubrum	trace	0	0	0	0	0	0	0	trace	rare	trace	2
Acer saccharum	1	0	30	0	1		25	3	1	27	7	2
Betula alleghaniensis	trace	0	5	0	2	1	14	4	9	rare	trace	10
Fagus grandifolia	6	0	0	4	0	1	0	1	0	0	0	2
Picea rubens	trace	0	0	2	2	1	trace	rare	0	0	0	0
rock (bare & exposed)	1	5	0	0	0	0	0	0	0	0	0	0
bare ground/ litter	85	18	40	90	89	94	54	53	55	60	45	65
moss	2	35	trace	1	2	1	rare	trace	trace	0	9	2
lichens	1	40	1	trace	1	trace	trace	trace	trace	2	3	trace
tree stump	0	0	0	0	0	0	0	0	0	0	0	7(531)
downed log (> 10 cm)	0	0	0	0	0	0	0	0	29	10(315)	16(531)	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Acer pensylvanicum	0	0	0	0	0	0	0	0	0	0	1	0
Acer saccharum	0	0	25	0	0	0	0	0	0	4	9	0
Betula alleghaniensis	1	21	40	0	0	0	13	24	40	0	0	38
Betula populifolia	0	0	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	12	18	0	27	0	8	5	17	0	16	8	0
Picea rubens	0	0	0	0	1	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer pensylvanicum	0	0	0	0	0	0	0	0	0	0	23	0
Acer saccharum	9	0	0	8	0	0	0	0	0	0	0	0
Betula alleghaniensis	0	0	20	0	0	0	0	4	0	0	0	0
Fagus grandifolia	35	27	0	11	1	20	12	60	65	45	30	20
Picea rubens	0	0	0	0	70	0	0	0	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	0	0	0	0	0	0	0	0	0	0	65
Acer saccharum	0	0	75	25	0	0	0	0	0	50	70	0
Betula alleghaniensis	0	0	0	0	75	85	0	0	0	0	0	0
Fagus grandifolia	24	55	60	70	0	0	80	70	80	65	60	79
Picea rubens	80	0	0	0	20	0	0	0	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number A&Y-2	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Maianthemum canadense	0	0	0	0	0	0	0	0	0	0	4	0
Trientalis borealis	0	0	0	0	0	0	0	0	0	0	1	trace
carex spp.	0	0	0	0	0	0	1	0	0	0	0	trace
unknown cotelyden	0	0	rare	0	0	0	0	rare	0	0	0	0
unknown cotelyden	0	rare	rare	0	0	0	0	0	0	0	0	0
unknown cotelyden	0	0	rare	0	0	rare	0	0	0	0	0	0
Acer pensylvanicum	0	0	trace	trace	0	4	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	0	trace	trace	3	rare	trace
Acer saccharum	0	0	rare	0	0	0	0	0	0	0	0	0
Betula populifolia	0	8	0	0	0	0	rare	0	0	trace	trace	rare
Fraxinus americana	0	0	0	0	0	0	0	0	rare	6	0	1
Pinus strobus	trace	10	26	0	40	trace	40	3	39	0	rare	25
dead red spruce branches	0	0	0	0	0	0	0	1	0	0	0	15(531)
bare ground/ litter	80	75	60	95	52	85	55	80	30	88	92	55
moss	6	4	9	3	12	7	trace	1	38	trace	0	1
lichens	1	1	1	trace	trace	trace	1	trace	6	trace	trace	trace
downed log (> 10 cm)	13(097)	0	0	0	0	0	0	12	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Abies balsamea	2	0	0	4	trace	0	22	0	1	0	0	0
Betula alleghaniensis	0	5	0	0	0	0	0	0	0	0	0	0
Fagus grandifolia	0	0	0	0	0	0	0	0	0	4	3	35
Picea rubens	11	4	2	0	2	0	0	0	1	0	11	15
snag	0	0	0	0	0	0	0	10	0	0	0	3(531)
dead red spruce branches	2	0	0	0	0	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Abies balsamea	0	0	0	55	0	0	30	0	2	0	0	0
Betula alleghaniensis	0	8	0	4	0	0	0	0	0	0	0	0
Fagus grandifolia	24	0	0	0	0	0	0	0	0	6	60	33
Picea rubens	3	11	2	0	0	0	9	0	0	0	8	0
snag	0	0	0	0	0	0	0	0	0	0	0	12(531)
dead red spruce branches	0	0	0	0	1	8	0	15	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer rubrum	0	0	0	0	0	0	0	0	0	0	85	0
Betula alleghaniensis	55	15	20	0	0	0	0	75	0	65	0	0
Fagus grandifolia	0	0	0	0	0	0	50	0	0	5	0	10
Picea rubens	12	79	35	55	55	70	18	35	40	0	0	0
Pinus strobus	0	0	80	0	0	0	0	0	0	0	0	0
snag	0	0	0	0	0	0	0	0	0	0	0	6(531)

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number A&Y-3	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
unknown cotelyden	0	rare	0	0	0	0	0	0	0	0	0	0
Abies balsamea	0	trace	0	trace	trace	trace	1	trace	trace	trace	0	0
Acer rubrum	0	0	0	trace	0	0	0	0	0	rare	0	0
Betula alleghaniensis	trace	trace	0	0	trace	0	0	0	0	0	0	0
Fagus grandifolia	0	0	0	0	0	0	0	0	rare	0	0	0
Quercus rubra	0	0	0	1	0	0	0	0	0	0	0	0
Picea rubens	trace	rare	1	0	0	rare	0	rare	2	rare	0	0
snag	0	0	0	0	0	0	0	0	0	0	1	0
dead red spruce branches	0	0	0	1	5(012)	0	0	0	1(012)	0	0	0
rock (bare & exposed)	0	0	0	0	0	1	0	0	26	2	0	16
bare ground/ litter	95	95	80	95	70	95	55	60	45	85	89	78
moss	2	trace	10	trace	3	trace	4	29	21	5	9	9
lichens	trace	trace	trace	trace	2	trace	12	4	1	3	trace	1
downed log (> 10 cm)	0	3	7	0	20	0	35	2	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Acer pensylvanicum	0	0	0	3	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	0	0	12	0	0	0	0	0	0
snag	3(097)	0	0	1	4(012)	0	0	0	0	0	1	0
dead red spruce branches	0	0	0	0	0	0	2	1	0	0	0	0
tip-up mound	0	0	0	0	0	0	0	0	0	0	0	6
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer rubrum	0	0	0	9	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	0	0	9	0	0	0	0	0	0
snag	0	0	0	1	0	0	0	0	0	0	1	0
dead red spruce branches	11	0	0	0	0	14	0	0	0	1	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Abies balsamea	0	0	0	30	45	0	0	50	0	0	0	45
Acer pensylvanicum	0	0	0	0	0	0	0	4	0	0	0	0
Acer rubrum	0	0	0	10	0	0	0	0	0	0	0	0
Betula alleghaniensis	0	55	0	0	0	0	0	0	0	0	0	30
Fagus grandifolia	0	65	0	0	0	0	0	0	0	0	0	0
Picea rubens	70	0	60	0	0	90	55	0	0	65	60	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number A&Y-4	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	0	0	4	0	0	0	0	0	0	0	0
Clintonia borealis	0	0	0	0	0	1	0	0	0	0	0	0
Lycopodium spp.	3	0	0	0	0	2	0	0	0	0	0	0
Maianthemum canadense	0	0	1	0	0	0	0	0	0	trace	0	0
Trientalis borealis	0	0	2	0	1	0	0	0	0	0	trace	0
carex spp.	0	0	0	0	trace	0	0	0	0	0	0	0
grass spp.	0	0	10	0	28	0	45	0	0	0	0	8
Dryopteris campyloptera	0	0	0	0	2	0	0	0	0	20	89	39
Vaccinium spp.	0	0	0	0	0	19	0	0	0	0	0	0
unknown cotelyden	0	0	0	0	0	0	0	0	rare	0	rare	0
Abies balsamea	trace	0	rare	0	0	trace	1	0	0	0	0	0
Acer pensylvanicum	0	0	0	trace	trace	0	trace	0	0	0	0	3
Acer rubrum	0	0	0	17	1	rare	0	0	0	0	0	0
Betula alleghaniensis	trace	0	trace	rare	trace	0	0	0	0	0	trace	0
Picea rubens	rare	4	rare	3	0	1	0	rare	20	0	0	2
Sorbus americana	trace	trace	17	rare	9	1	trace	0	0	0	0	trace
snag	1(097)	0	0	0	0	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	2	1	0	0	0	0
rock (bare & exposed)	0	8	3	0	0	0	4	0	20	5	0	0
bare ground/ litter	55	0	20	70	25	90	35	85	55	64	10	18
moss	11	13	35	trace	6	2	5	8	trace	10	1	22
lichens	7	17	9	1	2	1	6	5	trace	5	1	6
downed log (> 10 cm)	28	0	0	0	8	0	0	0	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Picea rubens	0	0	0	2	0	0	60	24	70	0	0	0
Sorbus americana	0	0	22	0	0	0	0	0	0	0	0	0
snag	3(097)	0	0	0	0	0	0	0	0	0	0	0
dead red spruce branches	0	3	0	5	0	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Picea rubens	7	0	0	2	0	0	35	50	75	12	0	0
Sorbus americana	0	0	2	0	0	0	0	0	0	0	0	0
dead red spruce branches	0	24	0	10	2	4	0	0	0	0	0	20
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer rubrum	0	0	0	0	0	0	0	65	25	0	0	0
Betula alleghaniensis	0	0	0	80	0	0	0	0	0	0	45	0
Picea rubens	75	90	0	55	60	45	0	30	0	60	0	85
Sorbus americana	0	0	18	0	0	0	0	0	0	0	30	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number A&Y-5	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	0	0	0	0	0	1	0	24	0	10	30	0
Aster spp.	18	11	9	0	0	1	0	0	3	12	33	0
Maianthemum canadense	0	0	0	0	0	0	0	0	0	35	0	0
Polygonatum pubescens	0	0	3	0	0	0	0	0	0	18	0	0
Trientalis borealis	1	trace	15	2	9	3	0	1	0	4	1	7
Trillium spp.	0	0	0	0	0	0	0	0	0	0	0	1
Uvularia sessilifolia	70	0	0	0	0	0	0	0	0	0	0	0
grass spp.	0	0	0	0	0	0	0	0	0	1	8	trace
Dryopteris campyloptera	2	9	0	9	11	0	99	55	95	0	44	12
Thelypteris phegopteris	0	0	0	0	0	2	0	0	0	0	0	0
Viburnum alnifolium	12	0	0	0	0	0	0	0	0	0	0	0
Acer pensylvanicum	14	2	7	11	9	9	trace	0	4	8	0	6
Acer rubrum	14	0	0	0	2	trace	0	0	0	0	0	7
Acer saccharum	12	18	6	12	2	19	0	rare	0	3	1	2
Betula alleghaniensis	0	0	0	rare	35	8	trace	rare	trace	0	0	trace
Fagus grandifolia	12	51	5	25	0	10	0	8	trace	22	9	4
Prunus virginiana	0	0	0	0	0	0	0	0	0	0	9	24
Sorbus americana	0	8	1	1	0	0	0	0	0	0	0	0
snag	0	0	0	0	10	0	0	0	0	0	0	0
bare ground/ litter	8	12	49	35	12	40	0	8	0	10	4	25
moss	1	2	0	1	0	trace	0	trace	8	trace	0	4
lichens	0	1	trace	trace	8	trace	trace	trace	trace	0	0	1
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Viburnum alnifolium (ho	12	0	0	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	0	0	0	0	0	24	1	0	0	0	0	0
Fagus grandifolia	26	8	45	35	7	27	0	38	0	38	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer saccharum	0	0	0	0	0	0	0	0	0	0	55	40
Betula alleghaniensis	0	0	0	0	0	0	20	0	0	0	0	0
Fagus grandifolia	18	60	5	35	45	35	0	60	45	80	0	24
Picea rubens	0	0	0	0	0	0	0	0	5	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer saccharum	0	0	0	65	15	0	0	0	0	70	65	76
Fagus grandifolia	40	65	60	15	35	30	25	40	20	0	0	0
Picea rubens	0	0	0	0	0	0	0	0	30	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number A&Y-6	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	18	40	17	1	1	0	0	3	40	6	0	13
Aster spp.	0	0	0	trace	1	0	0	0	0	0	0	6
Medeola virginiana	0	0	0	2	0	0	0	0	0	2	0	0
Trientalis borealis	0	trace	0	0	trace	2	6	0	0	0	trace	3
Uvularia sessilifolia	0	33	0	0	0	0	0	0	0	2	trace	trace
carex spp.	0	0	0	0	0	0	0	0	0	0	2	trace
Dryopteris campyloptera	0	0	8	0	0	0	0	0	0	trace	0	0
Thelypteris phegopteris	0	0	0	0	3	0	0	0	0	0	0	0
Viburnum alnifolium	0	0	0	0	25	0	0	0	3	0	0	0
unknown cotelyden	rare	0	0	rare	0	rare	0	rare	rare	0	0	0
Acer pensylvanicum	11	4	11	1	15	13	8	9	5	4	5	19
Acer rubrum	trace	3	0	0	rare	0	trace	0	0	trace	trace	0
Acer saccharum	0	0	0	0	0	1	trace	3	trace	trace	trace	0
Betula alleghaniensis	1	1	14	1	40	trace	0	0	rare	trace	trace	5
Fagus grandifolia	10	3	16	0	0	5	1	2	13	4	5	0
Picea rubens	rare	1	0	rare	0	0	0	rare	rare	trace	0	10
rock (bare & exposed)	0	0	0	0	0	0	0	0	0	0	1	2
bare ground/ litter	50	28	35	90	40	75	80	80	40	75	73	35
moss	2	0	5	trace	4	trace	0	trace	trace	2	6	10
lichens	1	1	trace	trace	3	trace	trace	2	trace	1	3	5
downed log (> 10 cm)	10	0	0	0	0	0	0	0	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Acer pensylvanicum	0	0	0	0	0	0	14	0	0	0	0	0
Betula alleghaniensis	0	0	5	0	0	0	0	0	0	0	0	0
Fagus grandifolia	0	0	35	12	24	35	2	3	20	18	34	9
Picea rubens	0	0	0	0	0	0	0	0	0	0	0	4
downed log (>10 cm)	0	0	0	0	7(531)	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Fagus grandifolia	0	19	20	22	13	45	12	60	0	45	28	60
Picea rubens	20	0	0	0	0	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	4	0	0	0	0	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer saccharum	0	0	0	0	0	0	25	0	0	30	0	70
Betula alleghaniensis	0	0	0	0	0	90	0	0	0	0	80	0
Fagus grandifolia	20	49	70	15	70	55	8	80	75	65	25	65
Picea rubens	35	0	0	85	0	0	0	0	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	6	6	6	6
Plot number A&Y-7	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Maianthemum canadense	0	0	0	0	0	0	12	0	0	0	0	0
Medeola virginiana	0	0	0	0	0	0	23	0	0	0	0	0
Polygonum convolvulus	0	0	0	0	0	0	1	0	0	0	0	0
Trientalis borealis	0	0	0	1	0	1	3	0	9	0	0	1
Uvularia sessilifolia	0	0	0	0	0	0	trace	0	0	5	0	0
Viola spp.	0	0	0	0	0	0	trace	0	0	0	0	0
carex spp.	0	0	0	0	0	0	trace	0	0	0	5	0
Dryopteris campyloptera	5	50	0	trace	0	3	0	trace	0	40	0	18
Rubus spp.	0	0	0	0	0	0	0	0	1	40	0	0
unknown cotelyden	0	rare	0	rare	rare	rare	0	rare	0	0	0	rare
Acer pensylvanicum	trace	0	0	7	2	8	30	3	25	0	rare	1
Acer rubrum	0	0	1	6	rare	1	40	4	10	0	0	7
Acer saccharum	0	0	0	2	0	0	1	0	14	0	0	0
Betula alleghaniensis	rare	0	0	0	rare	trace	trace	1	trace	4	rare	0
Fagus grandifolia	0	0	0	14	0	6	4	0	25	2	0	0
Picea rubens	22	0	rare	rare	5	trace	0	20	1	0	35	0
snag	0	0	0	0	0	0	0	0	0	0	0	1(531)
bare ground/ litter	70	40	85	60	85	50	15	70	25	30	58	65
moss	2	7	9	9	4	12	3	8	3	7	15	7
lichens	6	trace	2	1	trace	3	trace	6	1	11	4	1
downed log (> 10 cm)	0	0	0	0	0	14	0	0	13	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Acer rubrum	0	0	3	0	0	0	0	0	0	0	0	0
Betula alleghaniensis	0	0	0	0	0	0	0	0	trace	4	0	0
Fagus grandifolia	0	0	0	50	0	0	trace	0	55	9	0	0
Picea rubens	9	0	0	0	0	0	0	0	0	0	4	0
snag	0	0	0	0	0	0	0	0	0	0	0	7(531)
dead red spruce branches	0	2	0	0	0	0	0	0	4	5	2	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer pensylvanicum	0	0	0	3	0	0	0	0	0	0	0	0
Acer rubrum	0	2	35	0	0	0	0	0	0	0	0	6
Fagus grandifolia	0	0	0	0	0	0	1	0	65	8	0	0
Picea rubens	19	0	25	0	0	0	0	0	0	3	5	50
dead red spruce branches	0	3	0	0	2	7	0	30	6	0	3	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	0	0	20	0	0	0	0	0	0	0	0
Acer rubrum	0	35	60	0	0	0	40	0	0	0	0	65
Acer saccharum	0	0	0	0	0	0	0	25	0	0	0	0
Fagus grandifolia	0	0	0	35	20	0	0	0	0	0	0	0
Picea rubens	85	60	20	0	40	24	4	65	0	0	95	35

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	2	6	6	6	6	6	6	6	6
Plot number A&Y-8	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aster spp.	0	trace	0	0	0	0	8	0	0	0	0	0
Maianthemum canadense	13	17	0	0	0	0	0	0	0	0	0	0
Trientalis borealis	1	2	0	0	5	10	0	0	0	0	0	0
Uvularia sessilifolia	0	12	0	0	0	0	0	0	0	0	0	0
grass spp.	7	0	0	0	0	0	0	0	0	1	0	0
grass spp.	0	0	0	0	0	0	2	0	0	1	0	0
Dryopteris campyloptera	9	12	95	56	75	85	0	3	0	0	0	0
Ribes glandulosum	0	0	0	24	0	0	0	0	0	0	0	0
unknown cotelyden	0	0	0	0	0	0	0	rare	0	0	0	0
Acer pensylvanicum	1	2	2	0	0	0	0	0	1	0	0	0
Acer rubrum	0	0	0	0	0	trace	0	0	0	trace	rare	trace
Betula alleghaniensis	0	3	rare	17	trace	0	rare	1	1	0	0	trace
Fagus grandifolia	0	4	0	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	1	0	0	0	0	0	0	0	0	0
Picea rubens	rare	0	0	0	0	0	rare	2	trace	rare	0	rare
rock (bare & exposed)	0	0	0	0	0	0	0	2	1	2	0	0
bare ground/ litter	65	50	3	5	15	5	75	80	93	85	50	90
moss	3	5	4	25	0	12	1	6	2	8	11	5
lichens	trace	trace	trace	2	trace	1	1	2	trace	1	5	1
downed log (> 10 cm)	0	0	0	0	0	0	9(097)	0	0	0	34(097)	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Betula populifolia	0	0	0	20	0	0	0	0	0	0	0	0
Fagus grandifolia	0	28	0	0	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	0	15	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	3	3	0	0	0	0	1	2	1
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Acer rubrum	0	0	0	0	15	10	0	0	0	0	0	0
Fagus grandifolia	0	35	0	0	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	55	45	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	16	0	9	4	0	5
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	35	0	0	0	0	0	0	0	0	0	0
Acer rubrum	80	35	45	45	80	40	0	0	0	0	20	10
Betula alleghaniensis	0	0	0	0	0	0	0	85	0	0	0	0
Fagus grandifolia	0	10	60	0	0	0	0	0	0	0	0	0
Picea rubens	10	30	0	10	60	0	0	10	45	55	74	60
dead red spruce branches	0	0	0	0	0	0	14	0	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	6	6	6	6	6	6	2	6	6	2
Plot number A&Y-8	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Aralia nudicaulis	14	0	25	0	5	0	0	0	0	0	0	0
Coptis trifoliata	1	0	9	0	1	0	0	0	0	0	0	0
Cornus canadensis	0	0	9	0	0	0	0	0	0	0	0	0
Maianthemum canadense	0	0	0	0	0	0	8	0	0	0	0	0
Medeola virginiana	0	0	32	0	0	22	0	0	0	0	0	0
Trientalis borealis	2	0	2	3	2	2	3	0	0	0	0	0
Uvularia sessilifolia	0	0	0	4	29	0	0	0	0	0	0	0
Viola spp.	0	0	0	0	trace	0	0	0	0	0	0	0
grass spp.	0	0	0	0	0	0	12	0	0	0	0	0
grass spp.	0	0	6	1	26	0	0	0	0	0	0	0
Dennstaedtia punctilobula	0	0	0	0	0	20	0	0	0	0	0	0
Dryopteris campyloptera	2	0	0	0	0	65	7	95	34	0	0	0
Polystichum acrostichoides	0	0	0	0	0	35	0	0	0	0	0	0
Thelypteris phegopteris	0	0	0	0	0	0	2	0	4	0	0	0
Ribes glandulosum	0	0	0	0	0	0	0	4	0	0	0	0
Rubus spp.	0	0	1	0	0	9	0	0	0	0	0	0
Viburnum alnifolium	5	0	0	0	0	0	0	0	0	0	0	0
unknown cotelyden	rare	0	0	0	0	0	rare	0	0	0	0	0
Acer pensylvanicum	2	rare	6	2	1	1	0	0	0	0	0	0
Acer rubrum	0	0	rare	trace	0	0	0	rare	rare	0	0	0
Betula alleghaniensis	rare	0	0	0	0	0	0	0	0	rare	0	rare
Fagus grandifolia	0	0	0	1	0	0	0	0	0	0	0	0
Picea rubens	0	0	1	1	0	0	0	0	5	1	trace	6
Prunus serotina	0	0	0	48	20	0	0	0	0	0	0	0
Sorbus americana	0	0	0	rare	0	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	0	0	0	3
rock (bare & exposed)	0	0	0	0	0	0	1	4	1	10	1	2
bare ground/ litter	55	95	10	24	20	2	35	1	10	50	25	12
moss	4	1	8	13	0	1	24	2	64	35	55	24
lichens	1	1	trace	0	trace	20	5	trace	25	5	10	55
downed log (> 10 cm)	11(315)	0	0	0	0	21(316)	0	0	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Fagus grandifolia	0	0	2	0	0	1	0	0	0	0	0	0
Picea rubens	0	0	0	0	0	0	0	0	0	8	0	3
snag	3(097)	0	0	0	0	0	0	0	0	0	0	0
dead red spruce branches	0	1	0	0	0	0	0	0	0	0	0	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Betula alleghaniensis	0	0	0	0	0	0	0	15	25	0	0	0
Fagus grandifolia	10	55	0	33	0	55	0	0	0	0	0	0
Picea rubens	0	5	20	0	0	0	0	0	0	18	0	55
dead red spruce branches	0	6	0	0	7	0	0	18	0	0	0	0
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer rubrum	0	0	55	65	0	0	15	0	0	0	0	0
Acer saccharum	0	0	0	0	60	0	0	0	0	0	0	0
Betula alleghaniensis	0	0	0	0	0	0	0	24	74	0	0	0
Fagus grandifolia	5	0	40	0	0	25	0	0	0	0	0	0
Picea rubens	30	80	0	0	0	0	60	0	0	60	20	75
dead red spruce branches	0	0	0	0	0	0	0	3	0	0	0	0

Table A-9 (cont.) Vegetation structure indicator raw data from Bear Brook Watershed in Maine in 1997

STRATA 1: ground/bryophyte/lo herb layer = 0-0.61 m (0-2')												
Disturbance code	0	0	0	0	0	0	0	0	0	0	0	0
Dominant microhabitat	6	6	7	6	5	6	6	6	6	6	6	6
Plot number A&Y-8	Subplot 1			Subplot 2			Subplot 3			Subplot 4		
Quadrat number	1	2	3	1	2	3	1	2	3	1	2	3
Species: Latin name	Percent cover			Percent cover			Percent cover			Percent cover		
Cornus canadensis	0	0	0	0	0	4	1	0	10	0	0	0
Maianthemum canadense	0	0	0	trace	0	0	0	0	8	0	0	0
Trientalis borealis	1	0	1	0	rare	0	4	0	2	0	0	0
Uvularia sessilifolia	0	0	0	0	0	0	5	0	0	0	0	0
grass spp.	0	0	0	0	0	5	0	0	0	0	0	0
Dryopteris campyloptera	2	3	0	0	2	65	28	20	60	0	0	0
Ribes glandulosum	0	0	0	0	15	0	2	0	0	0	0	0
Acer rubrum	trace	0	0	0	3	0	1	0	0	0	0	0
Betula alleghaniensis	0	0	0	0	4	0	0	0	0	rare	rare	0
Fagus grandifolia	0	0	trace	0	0	0	0	0	0	0	0	0
Quercus rubra	0	0	25	0	0	0	0	0	0	0	0	0
Picea rubens	1	0	0	1	0	0	12	rare	0	0	0	rare
Sorbus americana	4	trace	0	0	0	0	4	0	0	0	0	0
Tsuga canadensis	0	0	0	0	0	0	0	0	0	0	0	0
snag	0	0	0	0	0	0	0	0	0	0	0	0
dead red spruce branches	0	0	0	0	0	0	0	0	0	0	0	0
rock (bare & exposed)	2	2	0	1	0	0	0	1	0	0	0	4
bare ground/ litter	85	78	70	88	5	15	22	55	8	93	99	90
moss	2	12	1	8	12	4	12	2	4	4	0	3
lichens	1	5	2	1	18	trace	8	1	1	1	trace	4
tree stump	0	0	0	0	22	0	0	0	0	0	0	0
STRATA 2: high herb/low shrub layer = 0.61-1.83 m (2-6')												
Betula alleghaniensis	0	0	0	0	4	0	0	0	0	0	0	0
Fagus grandifolia	0	0	5	0	0	0	0	0	0	0	0	0
Picea rubens	0	30	0	0	0	0	0	40	0	0	0	0
snag	4	0	0	0	0	0	0	0	0	1	5	0
STRATA 3: high shrub/low tree layer = 1.84-4.88 m (6-16')												
Betula alleghaniensis	0	0	0	0	0	15	0	0	0	0	0	0
Fagus grandifolia	0	0	0	0	0	0	0	0	0	0	0	15
Quercus rubra	0	0	5	0	0	0	0	0	0	0	0	0
Picea rubens	0	0	0	15	0	0	15	25	10	0	0	0
Sorbus americana	0	0	0	0	18	0	0	0	0	0	0	0
dead red spruce branches	4	2	0	0	0	0	0	0	0	10	20	4
STRATA 4: middle/upper tree layer = >4.88 m (>16')												
Acer pensylvanicum	0	20	0	0	0	0	0	0	0	0	0	0
Acer rubrum	0	0	0	0	0	0	0	58	0	0	0	0
Betula alleghaniensis	0	0	0	0	45	55	65	0	0	0	0	0
Quercus rubra	0	0	20	0	0	0	0	0	0	0	0	0
Picea rubens	69	80	0	85	0	0	0	10	85	90	60	90
Sorbus americana	0	0	0	0	25	0	0	0	0	0	0	0

Table A-10 Macrolichen species and relative abundances raw data from Bear Brook Watershed in Maine in 1996

WEST BEAR:

Species Code	Macro Lichens: Genius/Species	FHM Program Abundance Rating W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10
1012	*Allocetraria oakesiana*	0	2	1	1	0	0	2	2	2	3
301	*Anaptychia palmulata*	2	2	1	1	2	0	1	0	0	0
609	*Bryoria furcellata*	0	0	0	0	0	0	0	0	0	2
1102	*Cetrelia chicitae*	0	0	1	2	0	0	0	0	2	1
1104	*Cetrelia olivetorum*	2	0	3	2	0	1	0	0	1	3
1200	*Cladonia (sp.) #2*	0	0	0	0	0	1	0	0	0	0
1207	* *Cladonia caespiticia*	0	0	0	0	0	0	1	0	0	0
1210	* *Cladonia chlorophaea*	0	0	0	0	0	0	0	0	0	2
1211	*Cladonia coniocraea*	0	0	0	0	0	0	0	0	0	2
1415	*Collema subflaccidum*	2	2	2	2	2	2	0	0	0	0
2403	*Evernia mesomorpha*	0	1	1	2	0	2	0	0	0	1
2501	*Everniastrum catawbiense*	0	0	0	0	0	1	0	0	0	0
2601	*Flavoparmelia caperata*	2	2	0	2	0	0	1	0	0	3
2822	*Heterodermia speciosa*	0	1	0	0	0	0	0	0	0	0
3110	*Hypogymnia krogiae*	0	0	0	0	0	2	0	1	2	0
3116	*Hypogymnia physodes*	4	4	4	4	4	4	4	4	4	4
3121	*Hypogymnia tubulosa*	3	4	3	3	0	3	2	3	3	3
3301	*Imshaugia aleurites*	2	3	2	2	0	3	3	3	3	3
3611	*Leptogium cyanescens*	2	2	2	2	0	2	2	0	0	0
3628	* *Leptogium milligranum*	0	0	1	0	0	0	0	0	0	0
3905	*Lobaria pulmonaria*	1	2	3	1	1	2	0	1	0	0
3906	*Lobaria quercizans*	1	3	3	2	3	2	2	0	0	0
4005	*Melanelia fuliginosa*	1	2	2	2	0	0	0	3	2	2
4008	*Melanelia halei*	4	4	4	4	4	4	4	4	4	4
4013	* *Melanelia septentrionalis*	0	0	2	0	0	0	0	0	0	0
4015	*Melanelia subaurifera*	3	0	2	2	2	3	0	0	0	0
4101	*Menegazzia terebrata*	0	0	0	0	0	0	0	1	0	0
4201	*Myelochroa aurulenta*	1	0	0	0	1	0	0	0	0	2
4202	*Myelochroa galbina*	0	3	0	0	0	2	2	3	3	0
4801	*Parmelia fertilis*	2	0	0	2	2	0	0	0	0	0
4804	*Parmelia saxatilis*	2	2	0	0	0	2	2	3	2	2
4805	*Parmelia squarrosa*	3	0	0	0	2	3	4	1	3	3
4806	*Parmelia sulcata*	4	4	4	4	4	4	4	4	3	4
5201	*Parmeliopsis ambigua*	2	0	2	3	0	0	1	2	3	2
5613	*Phaeophyscia pusilloides*	0	1	3	0	2	0	0	0	1	0
5614	*Phaeophyscia rubropulchra*	4	4	4	4	4	3	3	3	3	4
5701	*Physcia adscendens*	0	1	0	0	0	1	1	0	2	0
5702	* *Physcia aipolia*	0	0	2	0	0	2	0	0	0	0
5716	*Physcia millegrana*	0	0	0	0	0	0	1	0	0	1
5723	*Physcia stellaris*	3	3	0	2	3	2	3	3	2	0
5901	*Physconia detersa*	0	2	1	1	0	0	2	0	0	0
6101	*Platismatia glauca*	3	3	2	3	0	1	0	1	0	2
6106	*Platismatia tuckermanii*	2	3	2	3	0	1	2	3	2	2
6301	* *Pseudevernia cladonia*	0	0	0	0	0	0	0	0	1	0
6708	*Punctelia rudecta*	4	4	4	4	3	3	4	3	3	4
6806	*Pyxine sorediata*	0	2	0	3	0	0	1	1	0	0
6901	*Ramalina americana*	3	2	1	3	2	2	2	2	1	2
1001	* *Tuckermannopsis americana*	0	1	1	1	0	0	0	0	0	0
1013	*Tuckermannopsis orbata*	1	0	0	0	0	1	0	1	2	1
8072	*Usnea subfloridana*	3	2	2	2	1	2	2	1	2	3
1015	*Vulpicida pinastri*	0	0	0	0	0	0	0	0	1	1
	Total abundance	19	41	42	42	19	41	37	36	38	45

Table A-10 (cont.) Macrolichen species and relative abundances raw data from Bear Brook Watershed in Maine in 1996

EAST BEAR:

Species Code	Macro Lichens: Genius/Species	FHM Program Abundance Rating E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10
1012	*Allocetraria oakesiana*	0	0	2	0	1	2	2	2	2	3
301	*Anaptychia palmulata*	0	3	1	2	3	1	0	1	2	1
609	*Bryoria furcellata*	0	0	0	0	0	0	0	0	0	2
614	* *Bryoria nadvornikiana*	0	0	0	0	0	0	0	0	0	2
8301	* *Candelaria concolor*	0	1	0	0	0	0	0	0	1	0
1102	*Cetrelia chicitae*	0	0	0	0	0	3	0	0	0	0
1104	*Cetrelia olivetorum*	0	2	0	2	0	3	0	1	0	1
1200	*Cladonia (sp.) #1*	0	0	0	0	0	0	0	0	1	0
1211	*Cladonia coniocraea*	0	0	2	2	0	0	0	0	0	0
1244	* *Cladonia furcata*	0	0	0	0	1	0	0	0	0	0
1233	* *Cladonia pyxidata*	0	1	0	0	0	1	2	0	0	2
1415	*Collema subflaccidum*	0	1	3	0	0	1	1	1	1	0
2403	*Evernia mesomorpha*	1	1	0	0	0	0	1	2	1	3
2501	*Everniastrum catawbiense*	0	0	2	2	0	0	0	0	0	0
2601	*Flavoparmelia caperata*	0	0	2	3	0	3	0	2	0	2
2822	*Heterodermia speciosa*	0	0	1	0	0	0	1	0	0	0
3110	*Hypogymnia krogiae*	0	0	3	2	0	0	4	0	3	3
3116	*Hypogymnia physodes*	4	4	4	4	4	4	4	4	4	4
3121	*Hypogymnia tubulosa*	0	2	0	3	0	3	3	3	3	3
3301	*Imshaugia aleurites*	0	3	3	3	0	3	2	2	3	2
3611	*Leptogium cyanescens*	0	2	2	0	0	0	1	0	1	2
3624	* *Leptogium laceroides*	0	0	0	0	0	0	0	0	0	1
3905	*Lobaria pulmonaria*	0	1	1	2	1	2	2	1	1	2
3906	*Lobaria quercizans*	1	3	3	1	0	2	2	1	2	1
4004	* *Melanelia exasperatula*	0	0	0	0	0	0	0	1	0	0
4005	*Melanelia fuliginosa*	3	3	2	2	3	2	0	2	2	0
4008	*Melanelia halei*	4	4	3	3	4	4	4	4	3	4
4011	* *Melanelia olivacea*	2	4	4	3	0	0	0	2	3	0
4015	*Melanelia subaurifera*	3	3	2	2	2	2	3	3	2	3
4101	*Menegazzia terebrata*	0	1	0	0	0	0	0	0	0	0
4201	*Myelochroa aurulenta*	0	0	0	3	0	3	0	0	0	0
4202	*Myelochroa galbina*	0	0	0	0	0	0	2	2	0	0
4801	*Parmelia fertilis*	1	0	0	1	0	0	0	0	0	2
4804	*Parmelia saxatilis*	0	2	2	2	0	2	3	2	3	2
4805	*Parmelia squarrosa*	2	0	0	4	3	4	3	3	4	4
4806	*Parmelia sulcata*	4	4	4	4	4	3	4	4	4	4
5201	*Parmeliopsis ambigua*	0	0	0	2	0	1	2	1	2	2
5301	* *Parmotrema arnoldii*	0	0	0	3	0	0	0	0	0	0
5511	* *Peltigera polydactyla*	0	0	0	0	0	0	1	1	0	0
5600	*Phaeophyscia sp.*	0	0	1	0	0	0	0	0	0	0
5613	*Phaeophyscia pusilloides*	0	0	0	1	0	0	0	1	0	0
5614	*Phaeophyscia rubropulchra*	4	4	4	4	4	4	4	4	4	4
5701	*Physcia adscendens*	0	0	0	0	3	0	0	1	0	0
5716	*Physcia millegrana*	0	0	0	0	0	0	0	1	0	0
5723	*Physcia stellaris*	2	2	0	2	3	2	2	3	2	2
5901	*Physconia detersa*	2	0	1	1	0	2	1	0	2	0
6101	*Platismatia glauca*	0	2	3	3	0	3	3	1	3	3
6106	*Platismatia tuckermanii*	2	0	3	3	2	2	3	2	3	2
6301	*Pseudevernia cladonia*	0	0	0	0	0	0	0	0	0	0
6708	*Punctelia rudecta*	4	4	4	4	4	4	4	4	4	4
6808	*Pyxine sorediata*	2	1	1	1	0	0	1	0	0	1
6901	*Ramalina americana*	1	0	0	0	2	2	2	1	2	1
6910	* *Ramalina dilacerata*	0	0	0	0	0	0	0	0	1	0

Table A-10 (cont.) Macrolichen species and relative abundances raw data from Bear Brook Watershed in Maine in 1996

EAST BEAR continued:

Species Code	Macro Lichens: Genius/Species	FHM Program Abundance Rating E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10
1013	*Tuckermannopsis orbata*	1	0	0	2	0	1	1	1	0	2
1017	* *Tuckermannopsis sepincola*	1	0	0	0	0	0	0	0	0	0
8029	* *Usnea filipendula*	0	0	0	0	0	0	0	0	1	0
8072	*Usnea subfloridana*	2	1	2	2	1	2	2	2	2	3
1015	*Vulpicida pinastri*	0	0	0	0	0	1	1	1	1	2
	Total abundance	46	59	65	78	45	71	70	66	72	77

* species recorded only in either West Bear or in East Bear

Table A-11 Tree seed indicator raw data (number of seeds per species per plot) from Bear Brook Watershed in Maine in 1997 (includes summer of 1997 and overwinter 1998)

Plot #	red spruce (# seeds)	striped maple (# seeds)	red maple (# seeds)	sugar maple (# seeds)	yellow birch (# seeds)	Am. beech (# seeds)	Total (# seeds)	Notes
W-1-1	0	0	0	0	0	0	0	
W-1-2	0	0	1	0	0	0	1	
W-1-3	0	1	1	0	0	0	2	
W-1-4	0	0	0	0	0	0	0	
W-2-1	0	0	0	1	0	0	1	
W-2-2	0	0	0	0	0	0	0	
W-2-3	0	0	0	0	0	0	0	
W-2-4	0	2	0	0	3	0	5	
W-3-1	2	6	0	0	0	1	9	
W-3-2	0	0	1	0	0	0	1	
W-3-3	0	0	1	0	0	1	2	
W-3-4	0	0	0	0	0	0	0	
W-4-1	0	0	0	0	0	0	0	
W-4-2	0	0	0	0	1	0	1	
W-4-3	1	0	0	0	0	0	1	
W-4-4	0	0	0	0	0	0	0	
W-5-1	0	0	0	0	0	0	0	
W-5-2	1	0	3	0	0	0	4	
W-5-3	0	0	0	0	0	1	1	
W-5-4	0	1	0	0	0	0	1	
W-6-1	2	0	0	0	0	0	2	8 red spruce cones
W-6-2	1	1	1	0	0	0	3	
W-6-3	0	0	0	0	0	0	0	
W-6-4	25	0	0	0	0	0	25	1 red spruce cone
W-7-1	0	0	0	0	0	0	0	
W-7-2	0	0	0	0	0	1	1	
W-7-3	4	0	0	0	0	0	4	1 red spruce cone
W-7-4	0	0	0	0	0	0	0	
W-8-1	0	0	0	0	0	0	0	
W-8-2	13	0	0	0	0	0	13	1 red spruce cone
W-8-3	0	0	0	0	0	0	0	
W-8-4	0	0	0	0	0	0	0	
W-9-1	1	0	0	0	0	0	1	
W-9-2	1	0	0	0	0	0	1	
W-9-3	0	0	1	0	0	0	1	
W-9-4	1	0	0	0	0	0	1	
W-10-1	1	0	0	0	0	0	1	
W-10-2	0	0	2	0	0	0	2	
W-10-3	13	0	19	0	0	0	32	
W-10-4	1	2	2	0	0	0	5	1 red spruce cone
WEST	67	13	32	1	4	4	121	
%	55%	11%	26%	1%	3%	3%	100%	

Table A-11 (cont.) Tree seed indicator raw data (number of seeds per species per plot) from Bear Brook Watershed in Maine in 1997 (includes summer of 1997 and overwinter 1998)

Plot #	red spruce (# seeds)	striped maple (# seeds)	red maple (# seeds)	sugar maple (# seeds)	yellow birch (# seeds)	Am. beech (# seeds)	Total (# seeds)	Notes
E-1-1	0	0	2	0	0	0	2	
E-1-2	0	0	0	0	0	0	0	
E-1-3	0	0	0	0	2	0	2	
E-1-4	0	2	12	0	0	0	14	
E-2-1	0	0	1	0	0	0	1	
E-2-2	1	0	5	0	0	0	6	
E-2-3	0	0	0	0	0	0	0	
E-2-4	0	0	0	0	0	0	0	
E-3-1	0	0	0	0	0	0	0	
E-3-2	18	0	0	0	0	0	18	4 red spurce cones
E-3-3	0	1	0	0	0	0	1	
E-3-4	0	0	1	0	0	0	1	
E-4-1	9	0	0	0	0	0	9	2 red spruce cone
E-4-2	0	0	0	0	0	0	0	
E-4-3	0	0	0	0	0	0	0	
E-4-4	0	0	1	0	0	0	1	
E-5-1	0	0	6	0	0	0	6	
E-5-2	0	0	0	0	0	0	0	
E-5-3	0	0	1	0	0	0	1	
E-5-4	0	0	7	0	0	0	7	
E-6-1	0	0	5	0	0	0	5	
E-6-2	0	0	0	0	4	0	4	
E-6-3	0	0	8	0	0	0	8	
E-6-4	0	0	3	0	0	0	3	
E-7-1	0	0	2	0	0	1	3	
E-7-2	0	0	0	0	0	2	2	
E-7-3	0	0	2	0	0	0	2	
E-7-4	0	0	1	0	0	0	1	
E-8-1	0	0	1	0	0	1	2	
E-8-2	0	3	0	0	0	0	3	
E-8-3	0	0	0	0	0	0	0	
E-8-4	0	0	0	0	0	0	0	2 red spruce cone
E-9-1	0	0	0	0	0	0	0	
E-9-2	0	0	0	0	0	0	0	
E-9-3	0	0	0	0	0	1	1	
E-9-4	0	0	0	0	0	5	5	
E-10-1	0	0	0	0	0	1	1	
E-10-2	0	0	8	0	0	0	8	
E-10-3	0	0	0	0	0	0	0	
E-10-4	0	0	9	0	0	0	9	
EAST	28	6	75	0	6	11	126	
%	22%	5%	60%	0%	5%	9%	100%	

Table A-11 (cont.) Tree seed indicator raw data (number of seeds per species per plot) from Bear Brook Watershed in Maine in 1997 (includes summer of 1997 and overwinter 1998)

Plot #	red spruce (# seeds)	striped maple (# seeds)	red maple (# seeds)	sugar maple (# seeds)	yellow birch (# seeds)	Am. beech (# seeds)	Total (# seeds)	Notes
A-1-1	0	0	0	0	0	0	0	3 red spruce cones
A-1-2	0	0	1	0	2	0	3	
A-1-3	0	0	0	0	0	0	0	
A-1-4	0	11	0	0	0	0	11	
A-2-1	0	0	0	0	0	0	0	
A-2-2	0	0	0	0	0	0	0	
A-2-3	0	0	0	0	0	0	0	
A-2-4	0	0	0	0	1	0	1	
A-3-1	4	0	0	0	0	0	4	
A-3-2	0	0	2	0	0	0	2	
A-3-3	0	0	0	0	1	0	1	
A-3-4	0	0	0	0	0	0	0	
A-4-1	3	0	0	0	0	0	3	7 red spruce cones
A-4-2	0	0	0	0	0	0	0	
A-4-3	0	0	0	0	0	0	0	
A-4-4	0	0	0	0	0	0	0	4 red spruce cones
A-5-1	0	0	0	0	0	0	0	
A-5-2	0	0	0	0	0	0	0	
A-5-3	0	0	0	0	0	0	0	
A-5-4	0	0	0	0	0	0	0	
Y-1-1	0	0	1	0	0	0	1	
Y-1-2	0	0	0	0	0	0	0	
Y-1-3	0	3	0	0	0	0	3	
Y-1-4	0	0	0	0	0	0	0	
Y-2-1	1	0	3	0	1	0	5	
Y-2-2	0	20	1	0	0	0	21	
Y-2-3	1	0	11	0	0	0	12	
Y-2-4	1	0	6	0	0	0	7	
Y-3-1	2	0	14	0	0	0	16	
Y-3-2	0	0	7	0	1	0	8	
Y-3-3	0	0	0	0	0	0	0	
Y-3-4	2	0	75	0	0	0	77	
Y-4-1	0	7	1	0	0	0	8	
Y-4-2	0	0	2	0	0	0	2	
Y-4-3	18	0	12	0	0	0	30	1 red spruce cone
Y-4-4	0	0	1	0	0	0	1	
Y-5-1	0	0	0	0	0	0	0	
Y-5-2	3	0	0	0	1	0	4	2 red spruce cone
Y-5-3	0	0	9	0	0	0	9	
Y-5-4	0	1	0	0	0	0	1	
A&Y	35	42	146	0	7	0	230	
%	15%	18%	63%	0%	3%	0%	100%	

Plots A-1 through A-5 and Y-1 through y-5 are also referred to as A&Y-1 through AY-10, respectively

Table A-12 Tree seed indicator raw data (number of seeds per species per plot) from Bear Brook Watershed in Maine in 1998 (includes summer of 1998 and overwinter 1999)

Plot #	balsam fir (# seeds)	red spruce (# seeds)	e.white pine (# seeds)	striped maple (# seeds)	red maple (# seeds)	sugar maple (# seeds)	yellow birch (# seeds)	gray birch (# seeds)	Am. beech (# seeds)	Total (# seeds)
W-1-1	0	8	0	8	0	0	144	1	1	162
W-1-2	30	15	0	7	0	6	184	0	13	255
W-1-3	0	0	0	0	0	0	3	0	0	3
W-1-4	0	11	0	3	0	26	134	0	11	185
W-2-1	0	6	0	0	0	14	27	0	0	47
W-2-2	0	8	0	3	0	24	29	0	4	68
W-2-3	0	15	0	0	0	8	236	2	3	264
W-2-4	0	11	0	6	0	3	200	0	0	220
W-3-1	0	6	0	2	0	1	17	0	1	27
W-3-2	0	5	0	0	0	1	7	0	6	19
W-3-3	0	7	0	1	0	0	191	1	6	206
W-3-4	0	9	0	0	0	2	453	0	0	464
W-4-1	0	6	0	0	0	5	37	1	1	50
W-4-2	0	20	0	3	0	0	497	1	2	523
W-4-3	0	7	0	7	0	5	15	0	4	38
W-4-4	0	17	0	3	0	2	76	2	0	100
W-5-1	0	15	0	0	0	1	15	1	0	32
W-5-2	0	32	0	0	0	6	213	0	2	253
W-5-3	0	18	0	1	0	7	11	2	0	39
W-5-4	0	9	0	0	0	3	30	0	0	42
W-6-1	0	57	0	8	0	0	96	0	0	161
W-6-2	0	16	0	1	0	0	62	2	0	81
W-6-3	0	34	0	3	1	0	410	0	0	448
W-6-4	0	36	0	0	0	0	0	0	0	36
W-7-1	0	15	0	0	0	2	69	0	0	86
W-7-2	0	18	0	0	1	17	13	0	5	54
W-7-3	0	25	0	0	0	0	16	0	0	41
W-7-4	0	17	0	0	0	0	18	0	0	35
W-8-1	0	64	0	0	0	0	5	0	0	69
W-8-2	0	33	0	1	0	0	4	0	0	38
W-8-3	0	67	0	0	0	0	31	0	0	98
W-8-4	0	95	0	1	0	0	4	1	0	101
W-9-1	0	326	0	0	0	0	16	4	0	346
W-9-2	0	77	0	1	0	0	4	0	0	82
W-9-3	2	73	0	11	0	1	100	0	0	187
W-9-4	0	84	0	0	0	0	24	0	0	108
W-10-1	0	36	0	0	0	0	49	6	0	91
W-10-2	0	5	0	0	0	0	763	3	0	771
W-10-3	0	39	0	9	27	0	255	6	0	336
W-10-4	0	234	0	2	0	0	124	10	0	370
WEST	32	1576	0	81	29	134	4582	43	59	6536
%	0%	24%	0%	1%	0%	2%	70%	1%	1%	100%

Table A-12 (cont.) Tree seed indicator raw data (number of seeds per species per plot) from Bear Brook Watershed in Maine in 1998 (includes summer of 1998 and overwinter 1999)

Plot #	balsam fir (# seeds)	red spruce (# seeds)	e.white pine (# seeds)	striped maple (# seeds)	red maple (# seeds)	sugar maple (# seeds)	yellow birch (# seeds)	gray birch (# seeds)	Am. beech (# seeds)	Total (# seeds)
E-1-1	0	31	0	2	5	1	336	0	0	375
E-1-2	0	10	0	0	0	0	259	1	6	276
E-1-3	1	19	0	1	0	15	152	2	0	190
E-1-4	0	18	0	0	12	0	47	0	3	80
E-2-1	0	135	0	2	0	0	474	0	0	611
E-2-2	0	28	0	0	0	0	170	0	8	206
E-2-3	0	13	0	1	0	1	120	1	2	138
E-2-4	0	10	0	0	1	3	416	1	3	434
E-3-1	0	6	0	0	0	3	188	9	2	208
E-3-2	0	27	0	1	0	0	256	9	0	293
E-3-3	0	7	0	1	0	0	267	3	0	278
E-3-4	0	5	0	0	0	8	428	0	0	441
E-4-1	2	455	0	1	0	0	77	0	0	535
E-4-2	0	22	0	12	0	0	182	5	10	231
E-4-3	0	11	0	0	1	2	248	2	5	269
E-4-4	38	242	0	0	0	0	67	2	0	349
E-5-1	0	15	0	1	0	0	32	2	0	50
E-5-2	1	144	0	4	0	0	208	2	1	360
E-5-3	0	14	0	0	1	0	8	0	0	23
E-5-4	0	12	0	0	0	0	45	2	0	59
E-6-1	0	19	0	1	3	3	185	0	0	211
E-6-2	0	6	0	0	0	2	162	2	0	172
E-6-3	1	7	0	2	9	0	335	1	0	355
E-6-4	0	5	0	1	0	1	23	1	0	31
E-7-1	0	1	0	1	0	6	11	1	6	26
E-7-2	0	5	0	0	0	0	142	1	10	158
E-7-3	0	5	0	0	1	0	68	1	1	76
E-7-4	0	32	0	0	0	0	60	2	1	95
E-8-1	0	15	0	1	0	0	177	2	1	196
E-8-2	0	8	0	1	0	0	70	3	0	82
E-8-3	0	11	0	0	0	0	604	2	17	634
E-8-4	0	24	0	23	0	0	49	4	0	100
E-9-1	0	0	0	3	0	0	154	2	8	167
E-9-2	0	0	0	0	0	0	0	0	0	0
E-9-3	0	2	0	0	0	0	1	4	7	14
E-9-4	0	0	0	0	0	11	96	1	16	124
E-10-1	0	14	0	0	1	0	115	2	0	132
E-10-2	0	5	0	0	2	1	16	4	4	32
E-10-3	0	2	0	0	1	1	56	19	0	79
E-10-4	0	2	0	0	0	2	105	3	2	114
EAST	43	1385	0	59	37	60	6408	92	106	8190
%	1%	17%	0%	1%	0%	1%	78%	1%	1%	100%

E-9-2 was omitted from the final counts due to lost data (after it was collected)

Table A-12 (cont.) Tree seed indicator raw data (number of seeds per species per plot) from Bear Brook Watershed in Maine in 1998 (includes summer of 1998 and overwinter 1999)

Plot #	balsam fir (# seeds)	red spruce (# seeds)	e.white pine (# seeds)	striped maple (# seeds)	red maple (# seeds)	sugar maple (# seeds)	yellow birch (# seeds)	gray birch (# seeds)	Am. beech (# seeds)	Total (# seeds)
A-1-1	0	64	0	10	0	5	130	1	2	212
A-1-2	0	5	0	1	0	0	476	0	12	494
A-1-3	0	1	0	0	0	0	32	0	1	34
A-1-4	0	0	0	1	0	6	74	0	0	81
A-2-1	0	12	0	0	0	0	37	1	0	50
A-2-2	0	51	0	0	0	0	19	0	0	70
A-2-3	0	23	0	0	0	0	131	0	0	154
A-2-4	0	5	0	0	0	0	325	6	2	338
A-3-1	24	141	0	1	0	0	6	20	0	192
A-3-2	6	27	0	0	0	0	8	8	0	49
A-3-3	8	39	0	0	0	0	3	2	0	52
A-3-4	2	205	0	1	1	1	30	17	0	257
A-4-1	0	0	0	0	0	0	5	0	0	5
A-4-2	0	84	0	0	0	0	85	0	0	169
A-4-3	0	84	0	0	1	0	345	1	0	431
A-4-4	0	136	0	0	0	0	452	0	0	588
A-5-1	0	2	0	0	0	11	17	1	3	34
A-5-2	0	22	2	0	0	22	86	3	0	135
A-5-3	0	0	0	0	0	0	0	0	0	0
A-5-4	0	5	0	0	0	14	32	0	9	60
Y-1-1	0	5	0	0	0	0	134	2	7	148
Y-1-2	0	6	0	7	0	0	33	1	1	48
Y-1-3	0	7	0	21	0	1	181	0	8	218
Y-1-4	0	5	0	3	0	3	58	1	1	71
Y-2-1	0	71	0	1	2	0	122	2	0	198
Y-2-2	0	118	0	10	0	11	8	0	0	147
Y-2-3	0	17	0	0	8	0	99	0	0	124
Y-2-4	0	34	0	3	0	1	394	0	0	432
Y-3-1	0	14	0	0	2	0	53	0	0	69
Y-3-2	0	10	0	0	1	0	14	0	0	25
Y-3-3	0	176	0	1	0	1	34	1	0	213
Y-3-4	0	57	0	0	1	0	60	0	0	118
Y-4-1	0	20	0	2	0	0	205	0	0	227
Y-4-2	0	7	0	0	3	0	23	0	0	33
Y-4-3	0	17	0	0	5	0	885	0	0	907
Y-4-4	8	31	0	1	0	0	59	0	0	99
Y-5-1	0	57	0	2	0	0	83	5	0	147
Y-5-2	0	134	0	0	0	0	333	6	0	473
Y-5-3	0	29	0	0	15	0	125	19	0	188
Y-5-4	1	100	0	0	2	0	8	5	0	116
A&Y	49	1821	2	65	41	76	5199	102	46	7401
%	1%	25%	0%	1%	1%	1%	70%	1%	1%	100%

A-4-1 was omitted from the final counts due to lost data (in the field)

(Plots A-1 through A-5 and Y-1 through Y-5 are also referred to as A&Y-1 through A&Y-10 respectively)

Table A-13 Li-cor 2000 raw data (using 5 and 3 rings) from Bear Brook in 1996 (plots in East and West Bear only)

a) Using 5 rings

Plot #			Collection Date			DIFN	DIFN avg.	Plot #			Collection Date			DIFN	DIFN avg.
W	1	1	24	AUG	1996	0.03	0.0265	E	1	1	15	AUG	1996	0.02	0.0125
W	1	2	24	AUG	1996	0.025		E	1	2	15	AUG	1996	0.016	
W	1	3	24	AUG	1996	0.028		E	1	3	15	AUG	1996	0.01	
W	1	4	24	AUG	1996	0.023		E	1	4	15	AUG	1996	0.004	
W	2	1	15	AUG	1996	0.012	0.01575	E	2	1	15	AUG	1996	0.006	0.009
W	2	2	15	AUG	1996	0.014		E	2	2	15	AUG	1996	0.007	
W	2	3	15	AUG	1996	0.02		E	2	3	15	AUG	1996	0.006	
W	2	4	15	AUG	1996	0.017		E	2	4	15	AUG	1996	0.017	
W	3	1	15	AUG	1996	0.024	0.014	E	3	1	15	AUG	1996	0.009	0.0105
W	3	2	15	AUG	1996	0.013		E	3	2	15	AUG	1996	0.008	
W	3	3	15	AUG	1996	0.01		E	3	3	15	AUG	1996	0.009	
W	3	4	15	AUG	1996	0.009		E	3	4	15	AUG	1996	0.016	
W	4	1	24	AUG	1996	0.016	0.01725	E	4	1	24	AUG	1996	0.021	0.02525
W	4	2	24	AUG	1996	0.023		E	4	2	24	AUG	1996	0.028	
W	4	3	24	AUG	1996	0.021		E	4	3	24	AUG	1996	0.019	
W	4	4	24	AUG	1996	0.009		E	4	4	24	AUG	1996	0.033	
W	5	1	5	SEPT	1996	0.036	0.04925	E	5	1	7	SEPT	1996	0.067	0.10225
W	5	2	5	SEPT	1996	0.036		E	5	2	7	SEPT	1996	0.111	
W	5	3	5	SEPT	1996	0.059		E	5	3	7	SEPT	1996	0.082	
W	5	4	5	SEPT	1996	0.066		E	5	4	7	SEPT	1996	0.149	
W	6	1	5	SEPT	1996	0.047	0.04925	E	6	1	8	SEPT	1996	0.092	0.06875
W	6	2	5	SEPT	1996	0.088		E	6	2	8	SEPT	1996	0.04	
W	6	3	5	SEPT	1996	0.039		E	6	3	8	SEPT	1996	0.098	
W	6	4	5	SEPT	1996	0.023		E	6	4	8	SEPT	1996	0.045	
W	7	1	7	SEPT	1996	0.064	0.06925	E	7	1	7	SEPT	1996	0.083	0.0795
W	7	2	7	SEPT	1996	0.071		E	7	2	7	SEPT	1996	0.083	
W	7	3	7	SEPT	1996	0.05		E	7	3	7	SEPT	1996	0.072	
W	7	4	7	SEPT	1996	0.092		E	7	4	7	SEPT	1996	0.08	
W	8	1	7	SEPT	1996	0.031	0.05	E	8	1	7	SEPT	1996	0.089	0.1005
W	8	2	7	SEPT	1996	0.066		E	8	2	7	SEPT	1996	0.072	
W	8	3	7	SEPT	1996	0.031		E	8	3	7	SEPT	1996	0.06	
W	8	4	7	SEPT	1996	0.072		E	8	4	7	SEPT	1996	0.181	
W	9	1	28	AUG	1996	0.011	0.01975	E	9	1	28	AUG	1996	0.05	0.06125
W	9	2	28	AUG	1996	0.014		E	9	2	28	AUG	1996	0.083	
W	9	3	28	AUG	1996	0.038		E	9	3	28	AUG	1996	0.064	
W	9	4	28	AUG	1996	0.016		E	9	4	28	AUG	1996	0.048	
W	10	1	28	AUG	1996	0.034	0.0585	E	10	1	28	AUG	1996	0.054	0.09425
W	10	2	28	AUG	1996	0.141		E	10	2	28	AUG	1996	0.086	
W	10	3	28	AUG	1996	0.029		E	10	3	28	AUG	1996	0.14	
W	10	4	28	AUG	1996	0.03		E	10	4	28	AUG	1996	0.097	

Note: DIFN stands for diffuse non-interception' and gives the probability that a photon of diffuse radiation will be able to penetrate the canopy (to the level of the sensor) without being intercepted by a canopy element (foliage, branches, boles, bird nests, etc.)

Table A-13 (cont.) Li-cor 2000 raw data (using 5 and 3 rings) from Bear Brook Watershed in Maine in 1996 (plots in East and West Bear only)

b) Using 3 rings

Plot #	Collection Date	DIFN	DIFN avg.	Plot #	Collection Date	DIFN	DIFN avg.
W 1 1	24 AUG 1996	0.018	0.0195	E 1 1	15 AUG 1996	0.015	0.00925
W 1 2	24 AUG 1996	0.019		E 1 2	15 AUG 1996	0.011	
W 1 3	24 AUG 1996	0.021		E 1 3	15 AUG 1996	0.008	
W 1 4	24 AUG 1996	0.02		E 1 4	15 AUG 1996	0.003	
W 2 1	15 AUG 1996	0.009	0.01225	E 2 1	15 AUG 1996	0.004	0.00625
W 2 2	15 AUG 1996	0.009		E 2 2	15 AUG 1996	0.006	
W 2 3	15 AUG 1996	0.016		E 2 3	15 AUG 1996	0.004	
W 2 4	15 AUG 1996	0.015		E 2 4	15 AUG 1996	0.011	
W 3 1	15 AUG 1996	0.019	0.01	E 3 1	15 AUG 1996	0.007	0.00825
W 3 2	15 AUG 1996	0.007		E 3 2	15 AUG 1996	0.006	
W 3 3	15 AUG 1996	0.007		E 3 3	15 AUG 1996	0.006	
W 3 4	15 AUG 1996	0.007		E 3 4	15 AUG 1996	0.014	
W 4 1	24 AUG 1996	0.01	0.01125	E 4 1	24 AUG 1996	0.011	0.0145
W 4 2	24 AUG 1996	0.015		E 4 2	24 AUG 1996	0.015	
W 4 3	24 AUG 1996	0.014		E 4 3	24 AUG 1996	0.01	
W 4 4	24 AUG 1996	0.006		E 4 4	24 AUG 1996	0.022	
W 5 1	5 SEPT 1996	0.032	0.05075	E 5 1	7 SEPT 1996	0.065	0.102
W 5 2	5 SEPT 1996	0.038		E 5 2	7 SEPT 1996	0.118	
W 5 3	5 SEPT 1996	0.057		E 5 3	7 SEPT 1996	0.091	
W 5 4	5 SEPT 1996	0.076		E 5 4	7 SEPT 1996	0.134	
W 6 1	5 SEPT 1996	0.048	0.05525	E 6 1	8 SEPT 1996	0.099	0.06675
W 6 2	5 SEPT 1996	0.097		E 6 2	8 SEPT 1996	0.045	
W 6 3	5 SEPT 1996	0.049		E 6 3	8 SEPT 1996	0.087	
W 6 4	5 SEPT 1996	0.027		E 6 4	8 SEPT 1996	0.036	
W 7 1	7 SEPT 1996	0.068	0.074	E 7 1	7 SEPT 1996	0.075	0.078
W 7 2	7 SEPT 1996	0.078		E 7 2	7 SEPT 1996	0.094	
W 7 3	7 SEPT 1996	0.05		E 7 3	7 SEPT 1996	0.068	
W 7 4	7 SEPT 1996	0.1		E 7 4	7 SEPT 1996	0.075	
W 8 1	7 SEPT 1996	0.035	0.057	E 8 1	7 SEPT 1996	0.086	0.08975
W 8 2	7 SEPT 1996	0.076		E 8 2	7 SEPT 1996	0.062	
W 8 3	7 SEPT 1996	0.032		E 8 3	7 SEPT 1996	0.058	
W 8 4	7 SEPT 1996	0.085		E 8 4	7 SEPT 1996	0.153	
W 9 1	28 AUG 1996	0.012	0.02325	E 9 1	28 AUG 1996	0.049	0.06175
W 9 2	28 AUG 1996	0.017		E 9 2	28 AUG 1996	0.079	
W 9 3	28 AUG 1996	0.047		E 9 3	28 AUG 1996	0.073	
W 9 4	28 AUG 1996	0.017		E 9 4	28 AUG 1996	0.046	
W 10 1	28 AUG 1996	0.033	0.057	E 10 1	28 AUG 1996	0.05	0.09575
W 10 2	28 AUG 1996	0.13		E 10 2	28 AUG 1996	0.087	
W 10 3	28 AUG 1996	0.027		E 10 3	28 AUG 1996	0.145	
W 10 4	28 AUG 1996	0.038		E 10 4	28 AUG 1996	0.101	

Note: DIFN stands for diffuse non-interception' and gives the probability that a photon of diffuse radiation will be able to penetrate the canopy (to the level of the sensor) without being intercepted by a canopy element (foliage, branches, boles, bird nests, etc.)

Table A-14 Li-cor 2000 raw data (using 5 and 3 rings) from Bear Brook Watershed in Maine in 1997 (plots in East Bear, West Bear, and A&Y)

a) Using 5 rings

Plot #	Collection Date	DIFN	DIFN avg.	Plot #	Collection Date	DIFN	DIFN avg.
W 1 1	1 SEPT 1997	0.02	0.02275	E 3 1	7 SEPT 1997	0.024	0.04525
W 1 2	1 SEPT 1997	0.024		E 3 2	7 SEPT 1997	0.046	
W 1 3	1 SEPT 1997	0.022		E 3 3	7 SEPT 1997	0.076	
W 1 4	1 SEPT 1997	0.025		E 3 4	7 SEPT 1997	0.035	
W 4 1	9 SEPT 1997	0.043	0.04475	E 4 1	7 SEPT 1997	0.041	0.0335
W 4 2	9 SEPT 1997	0.027		E 4 2	7 SEPT 1997	0.026	
W 4 3	9 SEPT 1997	0.027		E 4 3	7 SEPT 1997	0.044	
W 4 4	9 SEPT 1997	0.082		E 4 4	7 SEPT 1997	0.023	
W 5 1	11 SEPT 1997	0.017	0.017	E 5 1	7 SEPT 1997	0.023	0.05225
W 5 2	11 SEPT 1997	0.022		E 5 2	7 SEPT 1997	0.049	
W 5 3	11 SEPT 1997	0.015		E 5 3	7 SEPT 1997	0.048	
W 5 4	11 SEPT 1997	0.014		E 5 4	7 SEPT 1997	0.089	
W 6 1	7 SEPT 1997	0.036	0.03425	E 6 1	17 SEPT 1997	0.016	0.023
W 6 2	7 SEPT 1997	0.054		E 6 2	17 SEPT 1997	0.033	
W 6 3	7 SEPT 1997	0.025		E 6 3	17 SEPT 1997	0.015	
W 6 4	7 SEPT 1997	0.022		E 6 4	17 SEPT 1997	0.028	
W 7 1	7 SEPT 1997	0.032	0.04	E 7 1	17 SEPT 1997	0.023	0.02375
W 7 2	7 SEPT 1997	0.051		E 7 2	17 SEPT 1997	0.025	
W 7 3	7 SEPT 1997	0.032		E 7 3	17 SEPT 1997	0.023	
W 7 4	7 SEPT 1997	0.045		E 7 4	17 SEPT 1997	0.024	
W 8 1	7 SEPT 1997	0.019	0.0325	E 8 1	17 SEPT 1997	0.026	0.0265
W 8 2	7 SEPT 1997	0.05		E 8 2	17 SEPT 1997	0.035	
W 8 3	7 SEPT 1997	0.014		E 8 3	17 SEPT 1997	0.035	
W 8 4	7 SEPT 1997	0.047		E 8 4	17 SEPT 1997	0.01	
W 9 1	17 SEPT 1997	0.102	0.07	E 9 1	17 SEPT 1997	0.037	0.037
W 9 2	17 SEPT 1997	0.059		E 9 2	17 SEPT 1997	0.049	
W 9 3	17 SEPT 1997	0.044		E 9 3	17 SEPT 1997	0.032	
W 9 4	17 SEPT 1997	0.075		E 9 4	17 SEPT 1997	0.03	
W 10 1	18 AUG 1997	0.028	0.02825	E 10 1	17 SEPT 1997	0.016	0.0155
W 10 2	18 AUG 1997	0.008		E 10 2	17 SEPT 1997	0.02	
W 10 3	18 AUG 1997	0.036		E 10 3	17 SEPT 1997	0.016	
W 10 4	18 AUG 1997	0.041		E 10 4	17 SEPT 1997	0.01	

(Data was lost from 2 plots in West Bear and 2 plots in East Bear)

Note: DIFN stands for diffuse non-interception' and gives the probability that a photon of diffuse radiation will be able to penetrate the canopy (to the level of the sensor) without being intercepted by a canopy element (foliage, branches, boles, bird nests, etc.)

Table A-14 (cont.) Li-cor 2000 raw data (using 5 and 3 rings) from Bear Brook Watershed in Maine in 1997 (plots in East Bear, West Bear, and A&Y)

a) Using 5 rings

Plot #			Collection Date			DIFN	IFN avg.	Plot #			Collection Date			DIFN	IFN avg.
A	1	1	25	AUG	1997	0.007	0.00725	Y	1	1	6	SEPT	1997	0.014	0.017
A	1	2	25	AUG	1997	0.005		Y	1	2	6	SEPT	1997	0.015	
A	1	3	25	AUG	1997	0.009		Y	1	3	6	SEPT	1997	0.023	
A	1	4	25	AUG	1997	0.008		Y	1	4	6	SEPT	1997	0.016	
A	2	1	26	AUG	1997	0.03	0.03075	Y	2	1	6	SEPT	1997	0.02	0.01125
A	2	2	26	AUG	1997	0.042		Y	2	2	6	SEPT	1997	0.009	
A	2	3	26	AUG	1997	0.023		Y	2	3	6	SEPT	1997	0.007	
A	2	4	26	AUG	1997	0.028		Y	2	4	6	SEPT	1997	0.009	
A	3	1	17	SEP	1997	0.084	0.0565	Y	3	1	11	SEPT	1997	0.016	0.01725
A	3	2	17	SEP	1997	0.024		Y	3	2	11	SEPT	1997	0.012	
A	3	3	17	SEP	1997	0.039		Y	3	3	11	SEPT	1997	0.023	
A	3	4	17	SEP	1997	0.079		Y	3	4	11	SEPT	1997	0.018	
A	4	1	17	SEP	1997	0.019	0.025	Y	4	1	11	SEPT	1997	0.038	0.02375
A	4	2	17	SEP	1997	0.022		Y	4	2	11	SEPT	1997	0.016	
A	4	3	17	SEP	1997	0.038		Y	4	3	11	SEPT	1997	0.015	
A	4	4	17	SEP	1997	0.021		Y	4	4	11	SEPT	1997	0.026	
A	5	1	13	AUG	1997	0.012	0.01025	Y	5	1	18	AUG	1997	0.015	0.022
A	5	2	13	AUG	1997	0.011		Y	5	2	18	AUG	1997	0.017	
A	5	3	13	AUG	1997	0.009		Y	5	3	18	AUG	1997	0.019	
A	5	4	13	AUG	1997	0.009		Y	5	4	18	AUG	1997	0.037	

(Plots A-1 through A-5 and Y-1 through Y-5 are also referred to as A&Y-1 through A&Y-10 respectively)

Note: DIFN stands for diffuse non-interception' and gives the probability that a photon of diffuse radiation will be able to penetrate the canopy (to the level of the sensor) without being intercepted by a canopy element (foliage, branches, boles, bird nests, etc.)

Table A-14 (cont.) Li-cor 2000 raw data (using 5 and 3 rings) from Bear Brook Watershed in Maine in 1997 (plots in East Bear, West Bear, and A&Y)

b) Using 3 rings

Plot #	Collection Date	DIFN	DIFN avg.	Plot #	Collection Date	DIFN	DIFN avg.
W 1 1	1 SEPT 1997	0.022	0.0235	E 3 1	7 SEPT 1997	0.026	0.05275
W 1 2	1 SEPT 1997	0.024		E 3 2	7 SEPT 1997	0.052	
W 1 3	1 SEPT 1997	0.023		E 3 3	7 SEPT 1997	0.09	
W 1 4	1 SEPT 1997	0.025		E 3 4	7 SEPT 1997	0.043	
W 4 1	9 SEPT 1997	0.039	0.0455	E 4 1	7 SEPT 1997	0.043	0.0375
W 4 2	9 SEPT 1997	0.03		E 4 2	7 SEPT 1997	0.031	
W 4 3	9 SEPT 1997	0.028		E 4 3	7 SEPT 1997	0.052	
W 4 4	9 SEPT 1997	0.085		E 4 4	7 SEPT 1997	0.024	
W 5 1	11 SEPT 1997	0.011	0.01025	E 5 1	7 SEPT 1997	0.023	0.058
W 5 2	11 SEPT 1997	0.014		E 5 2	7 SEPT 1997	0.057	
W 5 3	11 SEPT 1997	0.009		E 5 3	7 SEPT 1997	0.063	
W 5 4	11 SEPT 1997	0.007		E 5 4	7 SEPT 1997	0.089	
W 6 1	7 SEPT 1997	0.039	0.0395	E 6 1	17 SEPT 1997	0.012	0.01925
W 6 2	7 SEPT 1997	0.061		E 6 2	17 SEPT 1997	0.026	
W 6 3	7 SEPT 1997	0.03		E 6 3	17 SEPT 1997	0.013	
W 6 4	7 SEPT 1997	0.028		E 6 4	17 SEPT 1997	0.026	
W 7 1	7 SEPT 1997	0.033	0.042	E 7 1	17 SEPT 1997	0.024	0.02
W 7 2	7 SEPT 1997	0.054		E 7 2	17 SEPT 1997	0.018	
W 7 3	7 SEPT 1997	0.032		E 7 3	17 SEPT 1997	0.018	
W 7 4	7 SEPT 1997	0.049		E 7 4	17 SEPT 1997	0.02	
W 8 1	7 SEPT 1997	0.021	0.03925	E 8 1	17 SEPT 1997	0.022	0.0245
W 8 2	7 SEPT 1997	0.064		E 8 2	17 SEPT 1997	0.032	
W 8 3	7 SEPT 1997	0.015		E 8 3	17 SEPT 1997	0.035	
W 8 4	7 SEPT 1997	0.057		E 8 4	17 SEPT 1997	0.009	
W 9 1	17 SEPT 1997	0.06	0.043	E 9 1	17 SEPT 1997	0.026	0.025
W 9 2	17 SEPT 1997	0.039		E 9 2	17 SEPT 1997	0.029	
W 9 3	17 SEPT 1997	0.026		E 9 3	17 SEPT 1997	0.026	
W 9 4	17 SEPT 1997	0.047		E 9 4	17 SEPT 1997	0.019	
W 10 1	18 AUG 1997	0.024	0.022	E 10 1	17 SEPT 1997	0.013	0.0125
W 10 2	18 AUG 1997	0.007		E 10 2	17 SEPT 1997	0.016	
W 10 3	18 AUG 1997	0.035		E 10 3	17 SEPT 1997	0.013	
W 10 4	18 AUG 1997	0.022		E 10 4	17 SEPT 1997	0.008	

(Data was lost from 2 plots in West Bear and 2 plots in East Bear)

Note: DIFN stands for diffuse non-interception' and gives the probability that a photon of diffuse radiation will be able to penetrate the canopy (to the level of the sensor) without being intercepted by a canopy element (foliage, branches, boles, bird nests, etc.)

Table A-14 (cont.) Li-cor 2000 raw data (using 5 and 3 rings) from Bear Brook Watershed in Maine in 1997 (plots in East Bear, West Bear, and A&Y)

b) Using 3 rings

Plot #			Collection Date			DIFN	DIFN avg.	Plot #			Collection Date			DIFN	DIFN avg.
A	1	1	25 AUG		1997	0.003	0.003	Y	1	1	6 SEPT		1997	0.006	0.00875
A	1	2	25 AUG		1997	0.002		Y	1	2	6 SEPT		1997	0.009	
A	1	3	25 AUG		1997	0.003		Y	1	3	6 SEPT		1997	0.011	
A	1	4	25 AUG		1997	0.004		Y	1	4	6 SEPT		1997	0.009	
A	2	1	26 AUG		1997	0.021	0.02125	Y	2	1	6 SEPT		1997	0.009	0.0055
A	2	2	26 AUG		1997	0.028		Y	2	2	6 SEPT		1997	0.005	
A	2	3	26 AUG		1997	0.019		Y	2	3	6 SEPT		1997	0.004	
A	2	4	26 AUG		1997	0.017		Y	2	4	6 SEPT		1997	0.004	
A	3	1	17 SEP		1997	0.051	0.03025	Y	3	1	11 SEPT		1997	0.009	0.01025
A	3	2	17 SEP		1997	0.016		Y	3	2	11 SEPT		1997	0.007	
A	3	3	17 SEP		1997	0.018		Y	3	3	11 SEPT		1997	0.014	
A	3	4	17 SEP		1997	0.036		Y	3	4	11 SEPT		1997	0.011	
A	4	1	17 SEP		1997	0.016	0.02075	Y	4	1	11 SEPT		1997	0.023	0.01175
A	4	2	17 SEP		1997	0.023		Y	4	2	11 SEPT		1997	0.008	
A	4	3	17 SEP		1997	0.027		Y	4	3	11 SEPT		1997	0.006	
A	4	4	17 SEP		1997	0.017		Y	4	4	11 SEPT		1997	0.01	
A	5	1	13 AUG		1997	0.009	0.0065	Y	5	1	18 AUG		1997	0.012	0.01675
A	5	2	13 AUG		1997	0.006		Y	5	2	18 AUG		1997	0.014	
A	5	3	13 AUG		1997	0.006		Y	5	3	18 AUG		1997	0.015	
A	5	4	13 AUG		1997	0.005		Y	5	4	18 AUG		1997	0.026	

(Plots A-1 through A-5 and Y-1 through Y-5 are also referred to as A&Y-1 through A&Y-10 respectively)

Note: DIFN stands for diffuse non-interception' and gives the probability that a photon of diffuse radiation will be able to penetrate the canopy (to the level of the sensor) without being intercepted by a canopy element (foliage, branches, boles, bird nests, etc.)

1865 THE UNIVERSITY OF MAINE

MAINE AGRICULTURAL AND FOREST EXPERIMENT STATION
5782 WINSLOW HALL
ORONO ME 04469-5782

5-5-38900