



Fundy Model Forest

~Partners in Sustainability~

Report Title: Compliance Survey

Author: Chase, J.

Year of project: 2000

Principal contact information:

File Name: Soil_and_Water_2000_Chase_ Compliance Survey

***The Fundy Model Forest...
...Partners in Sustainability***

“The Fundy Model Forest (FMF) is a partnership of 38 organizations that are promoting sustainable forest management practices in the Acadian Forest region.”

Atlantic Society of Fish and Wildlife Biologists
Canadian Institute of Forestry
Canadian Forest Service
City of Moncton
Conservation Council of New Brunswick
Fisheries and Oceans Canada
Indian and Northern Affairs Canada
Eel Ground First Nation
Elgin Eco Association
Elmhurst Outdoors
Environment Canada
Fawcett Lumber Company
Fundy Environmental Action Group
Fundy National Park
Greater Fundy Ecosystem Research Group
INFOR, Inc.
J.D. Irving, Limited
KC Irving Chair for Sustainable Development
Maritime College of Forest Technology
NB Department of the Environment and Local Government
NB Department of Natural Resources
NB Federation of Naturalists
New Brunswick Federation of Woodlot Owners
NB Premier's Round Table on the Environment & Economy
New Brunswick School District 2
New Brunswick School District 6
Nova Forest Alliance
Petitcodiac Sportsman's Club
Red Bank First Nation
Remsoft Inc.
Southern New Brunswick Wood Cooperative Limited
Sussex and District Chamber of Commerce
Sussex Fish and Game Association
Town of Sussex
Université de Moncton
University of NB, Fredericton - Faculty of Forestry
University of NB - Saint John Campus
Village of Petitcodiac
Washademoak Environmentalists



Fundy Model Forest

Compliance Survey

1. Introduction

One of the key indicators for sustainability within the Fundy Model Forest (FMF) is the level of compliance with various regulations and guidelines, which protect water. Previous investigations in the Kennebecasis River watershed showed that 46% of riparian areas were inadequately vegetated. More recently, the Soil and Water Technical Committee undertook a detailed study of the characteristics of the riparian area in all watersheds of the FMF, using GIS and assessment of aerial photography.

Since legislation requires a Watercourse Alteration Regulation permit for activity within 30 meters of the watercourse, the variable conditions of riparian zone fuelled discussions of whether or not regulations governing streamside activities are being followed.

A survey of relevant regulations and guidelines was completed in 1999 by Steve Woods on ----- date—title---- The Soil and Water Committee then designed the survey described here to provide data on the indicator.

The purpose of this study is to determine, for various watersheds, eco-regions, land ownership and land uses within the FMF, the level of compliance with regulations and guidelines that govern the protection of water quality. Also the study will supply information on the state of compliance with various regulation and guidelines within the FMF.

2. Study Design

This study was designed to provide a snapshot of the state of compliance with regulations and guidelines. The purpose was not enforcement since it was felt that landowners would be more co-operative in discussing permits and allowing access to their land if they felt that the data that was being collected was being collected for generic presentation only. The results of the study may suggest other projects that deal with mitigation activities or with the promotion of compliance among landowners and users

The study was also designed to provide a sample of the kinds of activities, which occur near or in streams and which are required to follow established laws and guidelines. In order to sample within the various watersheds, eco-regions, land use categories, land ownerships and road types, sampling transect or routes were selected along roads throughout the FMF.(map 1 page 5) Activities along these roads were observed and measured with respect to compliance. The routes selected for study in the compliance report were representative of various sectors of the FMF which were:

Watersheds:

Kennebecasis
Bay Shore
Petitcodiac
Canaan
Belleisle

Eco-Regions:

Grand Lake
Eastern Lowlands,
Fundy Coastal
Southern Uplands
Continental Lowlands

Land Ownership:

Crown land
Large freehold
Municipal
Fundy National Park
Private

Land Uses:

Forest
Municipal, residential
Agriculture
Fundy National Park

Routes were also chosen to be representative of the various road types: encountered in the Fundy Model Forest

- Primary DOT highways
- Secondary Dot highways
- Primary forest road
- Secondary forest roads
- Woodlot roads

The compliance survey was designed to undertake a representative sub-sampling of activities in or near watercourses within the FMF. The activities observed and data gathered were from various categories and included the following:

Stream crossings:
bridge, culverts, fords

Agricultural
topsoil removal,
manure storage
water removal

Industrial approvals:
physical alteration
sediment control

Buffer operations:
tree harvesting,
construction
agricultural,
tilling,
cropping
grazing,
residential
landscaping

Ponds, dams, diversions,
channalization:
infilling,
draining (wetlands)
water removal,
riprap,
operation of heavy machinery,
ditching (breaking stream
embankment)

This process enabled a wide range of sampling within the FMF. Routes were driven and observations made of activities, for which permits were issued within the last four years, and of activities which had no permits, but for which permits are required. It should be noted that many of the sites may have had permits issued at an early date previous to the four year period and these could be researched at a later date.

Twenty-six routes were chosen; twenty-two routes were completed due to time limitations

3 Sampling Methods

Previous to any field activities, permits for the last four years were identified and locations were plotted on the FMF Geographic Information Systems. Permits in the vicinity of the routes were obtained from Department of the Environment Local Government and these were used to establish compliance with the regulations and guidelines.

Goals were established to ensure even sampling across the various sectors. As routes were chosen, a cumulative total of number of kilometers of road in each sector was maintained to ensure the sampling goals were met. In the field three basic categories were observed and observations were recorded on a form these categories were: (past and present) stream crossings, activities known to have Watercourse Alteration Regulations permits and other activities which were considered violations of

existing regulations and guideline. Note that violations were recorded and not compliance which is difficult to document since there are often no specific visual clues. This is acknowledged to be a fault of the sampling design that might be corrected by a more random sampling method.

Each route was designated a number from 1-26 the technician recorded the date of inspection and the compliance activity, choosing from: stream crossings, buffer operations, ponds, dams, diversions, channelization, agriculture activities and industrial approvals. The activity was then given a site number that was placed on the field map. It was then determined if the activity had a permit at this time or was covered by an annual operating plan. To determine the time the activity occurred the technician would determine whether it had been recent (within last two month), within last year, or over a year, using clues such as the riparian growth around the activity site. or using the permit date if there was a permit.

For an activity with a permit, the permit number, type of permit, provisional, regular, Forest Management Manual (crown land) authorization and permit description were recorded. The guidelines and regulations of the permit were then followed to evaluate the compliance or non-compliance of the permit conditions. The permit conditions were recorded along with condition description, and a description of any non-compliance and a code was also assigned to indicate extent of compliance. The codes used were 1. Met conditions, (if all guidelines and regulations were met) 2. Minor departure from conditions, (if one or two of the guidelines or conditions were not met) 3. Major departure from conditions, (if the majority of the guidelines or conditions were met), 4. Total failure to comply, (if none of the guidelines or conditions were met).

Other activities of non-compliance and infractions observed along the route that did not have a permit (or that a permit was not available for at this time) were also recorded. It was noted if the activity was done in a manner consistent with the standard permit requirements or BMPs. All sites were then given a code corresponding to the level of compliance, 1. Met requirements, (if all permit requirements or BMPs were met), 2. Minor departure from requirements, (if one or two of the permit requirements or BMPs were not met), 3. Major departure from requirements, (if three or four of the permit requirements or BMPs were not met), 4. No requirements met, (if none of the permit requirements or BMPs were met).

Each route was also driven with the purpose of checking all culverts and bridges to determine if they were stream crossings that impacted the watercourses or if they were ditch crossings that did not impact on the watercourse. Early in the study, the decision was made not to include ditch crossings, gullies, ditches or other indications of spring run off. There was some disagreement on this decision because the Clean Water Act states that these are watercourses. The Clean Water Act states “ *a watercourse*” means the full width and length, including the bed, banks, sides and shoreline, or any part, of a river, creek, stream, spring, brook, lake, pond, reservoir, canal, ditch or other natural or artificial channel open to the atmosphere, the primary function of which is the conveyance or containment of water whether flow be continuous or not. This decision was made because of time constraints on the project.

All culverts that impacted a watercourse were looked at to see if they complied with the regulations and guidelines of WAR and the FMM and if they were done in a manner consistent with standard permit requirements or BMPs. The culvert standards were summarized so they could be itemized consistently in the field: set 15 cm. into streambed, culvert slope 0.5%, fill slope 2:1, stabilization , diversion ditches.

The longitude and latitude of each site were taken with a GPS unit, or if GPS readings were not available, by GIS readings. The eco-region, watershed, stream name, and mainstem associated with the tributary were taken from the field maps and recorded. The highway route number and nearest access were taken from the New Brunswick road maps, then recorded. A short description of infraction or non-compliance was also given if needed.

4 Results:

Activities with a permits:

There were 64 sites with permits that covered the previous four years.(chart 2 page 9) The rest of the sites may have had permits, however because of the numbers of sites, it was decided to only go back 4 years. It

was also found that the GIS locators on maps were not very accurate and at times it took extra effort to locate these permits. In future a search could be done for permits prior to 1997 at the archives of The Department of Environment and Local Government.

There were 44 permits that met conditions, 5 permits had minor departures, 6 permits had major departures, 4 permits had total failure and 5 were not yet started yet. The permits overall were quite acceptable, with 69% meeting all the conditions. The permits that had major departures or total failure were at times not caused by failure to comply originally but because of lack of maintenance on the older sites. Over time harsh weather conditions have caused erosion problems that should have been maintained. An example of this was reconstruction of a portion of road that was washed out and repaired, a year later the road was once again washing out. This was also the case with many of the culverts, and one of the bridges.

Activities without permits:

There were 392 activities that were recorded without permits, however as stated above some of these may have had permits in earlier years. Of the 292 of these activities that were culverts, 5 met requirements, 131 had minor departures, 86 had major departures, and 70 met no requirements. Most of the sites with minor departures were that the culverts were not set in or diversion ditches had not been constructed. The sites with major departures also did not have stabilization or a 2:1 fill slope. The main problems with these sites was a lack of maintenance over the years, regrading of dirt roads causing the banks of the roads to change, or flooding of the roads causing stabilization and fill slopes to wash away. Many of these culverts have been installed 20 or 30 years ago and maintenance is needed. There were 48 bridge sites, of these 34 met requirements 11 had minor departures, 2 had major departures and only 1 met no requirements. Overall the bridges were well maintained.

It was also found that agriculture, residential and municipal areas had a high rate of non-compliance. There were 24 sites associated with agriculture activity and 21 sites met no requirements. There were 15 sites in residential areas and 15 sites met no requirements. These areas should be looked at to see why there is such a high failure rate. One of the problems is with a watercourse running through a farmers field and being treated as a ditch. In the residential areas, the homeowners wish to landscape and incorporate the stream into the landscaping plans; this causes the streams to have no riparian zones because of mowing to streams edge.

In the case of other land uses (such as construction, tree harvesting, infilling, draining, water removal, ditching, topsoil removal, manure storage, physical alterations, sediment control, water removal, fords and ponds), it was difficult to draw any conclusions because of the small number of sites. To draw any conclusion on these types of sites a different methodology, close observations and a wider range of permits would be needed.

5. Recommendations:

1. A letter from the Fundy Model Forest Partnership to the Department of Environment and Local Government should be written to suggest that permits include a clause concerning continuing maintenance of the activity. The survey showed that a lot of the non-compliance with permits was really a lack of maintenance over the years.
2. There should be more inspection and follow up on permitted activities by the Department of the Environment and Local Government
3. Landowners should have the responsibility to maintain their property in a manner that follows a Best Management Practices approach.
4. Landowners undertaking activities in or near the water should obtain a permit when one is required.
5. Further studies should be done on agricultural and residential areas because of the high rate of failure to follow regulations and guidelines
6. Any subsequent study should involve assessing compliance in a wider sampling of permits, in order to access a wider range of activities within the FMF.

Compliance Survey

Route selection by ownerships, road types and landuses in kilometers

Ownerships (km of roads)				
Crown	Freehold	Private	Park	Total
117.9 km.	86.8 km.	227.8 km.	37.6 km.	470.1

Roads Types (km. of roads)					
Primary DOT	Secondary Dot	Primary Forest	Secondary Forest	Woodlot	Total
114.5 km.	194.6 km.	68.1 km.	86.1 km.	6.8 km.	470.1

Landuses (km of roads)				
Forest	Agriculture	Municipal, Private	Park	Total
290.8 km.	109.9 km.	35.5 Km.	33.9 Km	470.1

Activities done without a permit under the regulations and guidelines of WAR, FMM and done in a manner consistent with standard permit requirements or BMPs						
Activity without permit	Met requirements	Minor departure from requirements	Major departures from requirements	No requirements met	Activity with permit	
Agriculture-cropping	3			7		
Agriculture-grazing				8		
Agriculture-tilling				6		
Bridges	34	11	2	1	16	
Construction				3	11	
Culverts	5	131	86	70	9	
Ditching	1					
Draining					1	
Ford				2	2	
Heavy equipment oper.					1	
Other			1	1		
Physical alteration					2	
Pond				6	2	
Riprap					10	
Residential Landscaping				15		
Tree Harvesting				1	8	
Water removal					2	
Total	43	142	89	120	64	
Total # of sites						458

Chart 4 Page 11

Culverts without Permits and The Associated Land Uses

Culvert Standards	Crown Land	Farm	Fundy Park	Large Freehold	Municipal	Residential	Woodlot	Total
Met requirements	1	3		1				5
Minor Departure	25	36	10	18	1	24	17	131
Major Departure	14	24	12	7		10	19	86
No Requirements Met	24	13	12	9	1	4	7	70
Total # of Sites	64	76	34	35	2	38	43	292

Culverts with Permits and The Associated Land Uses

Culvert Standards	Crown Land	Farm	Fundy Park	Large Freehold	Municipal	Residential	Woodlot	Total
Met Conditions		1				2		3
Minor Departure		1						1
Major Departure	1						1	2
Total Failure to Comply		2					1	3
Total # of Sites	1	4				2	2	9

ECO-REGIONS

Route #	Eco-Region	# of sites			Route #	Eco-Region	# of sites
2	Grand Lake	4			14	Continental Lowlands	34
	Continental Lowlands	3			15	Southern Uplands	33
3	Grand lake	14			17	Eastern Lowlands	17
4	Continental Lowlands	45			18	Southern Uplands Fundy Coastal	15 4
5	Fundy Coastal	3			19	Southern Uplands	10
	Southern Uplands	9			20	Southern Uplands	4
6	Southern Uplands	12			21	Southern Uplands	11
7	Continental Lowlands	16			23	Grand Lake	24
8	Eastern Lowlands Continental Lowlands Southern Uplands	13 11 6			24	Southern Uplands	58
9	Eastern Lowlands	15			26	Southern Uplands	8
	Continental Lowlands	3					
10	Continental Lowlands	35					
11	Continental Lowlands	17					
12	Southern uplands Fundy Coastal	8 4					
13	Grand Lake	18					

Table of Contents

Page 1	Introduction Study Design
Page 2	Study Design Sampling Methods
Page 3	Results: Activities with a permit
Page 4	Activities without a permit Recommendations
Page 5	Map 1, Compliance Survey- Routes
Page 6	Map 2, Compliance Survey-Watersheds
Page 7	Map 3, Compliance Survey-Eco-Regions
Page 8	Chart 1, Route Selection by ownerships, road types and landuses in Kilometers
Page 9	Chart 2, Compliance Report Route Selection
Page 10	Chart 3, Eco-Regions
Page 11	Chart 4, Activities done with out a permit under the regulations and quidelines of WAR, FFM and done in a manner consistent with permit requirements or BMPs
Page 12	Chart 5, Culverts without Permits and The Associated Land Uses Chart 6, Culverts with Permits and The Associated Land Uses
Page 13	Form 1, Fundy Model Forest Compliance Survey (data base copy)
Page14	Form 2, Fundy Model Forest Compliance Survey (field copy)
Page 15	Appendix: 45 pages of data base

Fundy Model Forest

COMPLIANCE SURVEY

A PROJECT OF THE SOIL AND WATER TECHNICAL COMMITTEE

Completed by

Jo-Ann Chase
November 11 2000

COMPLIANCE SURVEY ROUTE SELECTION

watershed	Route #	# of stream crossings	# permit	Activity without permit	# of km in route
Kennebecasis	14	19	14	1	35.0
Kennebecasis	26	8	0	0	20.1
Kennebecasis	4	16	2	5	11.9
Kennebecasis	7	6	9	1	14.3
Kennebecasis	10	28	4	2	33.9
Kennebecasis	24	42	1	15	31.0
Kennebecasis	15	10	2	1	05.6
Sub totals		129	32	25	151.8
Bayshore	15	17	3	1	35.4
Bayshore	12	9	2	1	13.8
Bayshore	5	10	2	0	14.4
Bayshore	20	4	0	0	7.5
Bayshore	6	11	1	0	15.9
Bayshore	21	11	0	0	6.3
Bayshore	18	19	0	0	13.7
Bayshore	19	9	0	0	7.8
Sub totals		90	8	2	114.8
Petitcodiac	8	20	10	2	29.1
Petitcodiac	9	12	3	3	42.4
Petitcodiac	19	1	0	0	8.7
Petitcodiac	17	13	2	2	12.9
Sub total		46	15	7	93.1
Canaan	2	6	1	1	9.4
Canaan	23	18	3	2	19.9
Canaan	13	17	0	1	25.3
Canaan	3	14	0	1	22.6
Sub total		55	4	5	77.2
Belleisle	4	16	3	4	15.8
Belleisle	11	14	2	1	17.4
Sub total		30	5	5	33.2
Total		350	64	44	470.1