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CARNATION CREEK FOLLOW-UP
TECHNICAL WORKSHOP
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James
D. K. ...
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THE CARNATION CREEK
FOLLOW-UP TECHNICAL WORKSHOP
RESULTS

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April 19 - 21, 1983
Parksville, British Columbia

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CARNATION CREEK TECHNICAL FOLLOW-UP WORKSHOP RESULTS MR 23

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PART I - PROPOSED CRITICAL PATH

June 30, 1983

Distribution of Working Group Summaries and strategy for developing

- (a) statement of forestry/fisheries principles
- (b) revised guidelines

Distribution to include Workshop participants, agencies, coastal forest industry and pertinent sectors of public. Responses to be forwarded by August 15, 1983.

August 15, 1983

Commence drafting of "Coastal Logging Guidelines". Commence drafting of supplementary discussion paper on new initiatives (compensation, evaluation, etc.).

August 31, 1983

Deadline for first draft by Streamside Classification Committee on:

- (1) Streamside Classification System
- (2) Glossary
- (3) Inventory Standards

October 1, 1983

Distribute first draft of the Coastal Logging Guidelines and New Initiatives Paper for comments by November 10, 1983.

November 15, 1983

Coastal Logging Guidelines and New Initiatives Paper to be revised, as required and distributed.

January 31, 1984

Revised Coastal Logging Guidelines to be issued as an interim position on a one year trial basis and a New Initiatives Paper to be distributed for further discussion. Training programs to be introduced.

February 1, 1984

New initiatives related to inventory, research, stream classification, etc., to be addressed.

February 1, 1985

Convene workshop to assess the results of one year interim trial and recommend revisions where required.

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PART II - COASTAL LOGGING GUIDELINES*

THIS OUTLINE IS INTENDED TO BE A COMPILATION OF THE RESULTS OF THE CARNATION CREEK WORKSHOP. AS SUCH IT INCLUDES ALL PERTINENT DISCUSSION AND SUGGESTIONS, EVEN THOUGH SOME ARE CONFLICTING AND WILL UNDOUBTEDLY BE MODIFIED OR EVEN DISREGARDED IN THE FINAL GUIDELINES.

I. PREFACE

It was agreed at the workshop that a statement on integrated resource management was needed as a preface to the guidelines. The following statement was suggested by Working Group #3:

"The deliberate and careful planning of the integration of various resource uses, to interfere with each other as little as possible and to compliment each other as much as possible, with due regard for their order of importance in the public interest in each management area, in order to achieve the optimum social and economic benefit to the people of British Columbia."

In addition, the following is a first draft of a preamble to the guidelines, as prepared by the Steering Committee for your review:

"Man's demands on the renewable, natural resources of British Columbia continue to rise. The diversity of these demands create highly complex and emotional situations as individual proponents seek to entrench or extend their own interests. Integrated resource management is the only means of ensuring a fair solution directed to an optimal balance between both the conflicting consumptive and nonconsumptive demands and the different economic and social values.

These guidelines provide the basis for users of the fishery and forest resources to reach agreement on management constraints and actions which will result in the best balance between maintaining or enhancing the fishery resource and maintaining a healthy, profitable forest industry.

Individual users of the guidelines are reminded that fish and forests co-exist in the same watersheds and that fish habitat is inextricably dependent on the forest cover and other, lesser vegetation which binds the soil, cools the water, dissipates kinetic energy and provides plant and insect elements of the fish food-chain.

At the same time, forest harvesting is an expensive, hazardous and complex operation. Constraints must attempt to balance values protected with the cost and difficulty of achieving protection."

* WE HAVE USED THE TERM "COASTAL LOGGING GUIDELINES" AS THIS WAS THE TRADITIONAL WAY THE PAST GUIDELINES WERE REFERRED TO. WE WILL ACCEPT ANY SUGGESTIONS FOR A "BETTER" NAME, IF DESIRABLE.

II. PLANNING GOALS

NO SET OF GUIDELINES WILL EVER COVER ALL SITUATIONS THAT EXIST IN THE FIELD. THEIR SUCCESSFUL APPLICATION WILL DEPEND ON REASONABLE PEOPLE USING REASONABLE JUDGEMENT, RATHER THAN ROTE INSTRUCTIONS. THIS THEN BECOMES THE UNDERLYING PRINCIPLE OF THESE GUIDELINES.

THE FOLLOWING PLANNING OBJECTIVES AND ORGANIZATIONAL CONCERNS NEED TO BE CONSIDERED IN THE PREPARATION OF THE NEW COASTAL LOGGING GUIDELINES:

1. PLANNING OBJECTIVES

- (a) Processes should be developed which will lead to the preparation and approval of plans and site-specific prescriptions for timber harvesting and other forestry treatments.
- (b) Specific objectives would facilitate the harvest of the largest amount of merchantable timber possible, subject to constraints which will minimize and/or mitigate the impact on all other resources.
- (c) Approval will be granted by the Ministry of Forests, in consultation with the Department of Fisheries and Oceans and to Fish and Wildlife Branch, Ministry of Environment.
- (d) Management plans for a watershed should include provision for the protection and/or enhancement of all resources and resource uses: i.e., timber, fish, wildlife, recreation, aesthetics, water and domestic animals.
- (e) An additional level of long-term planning (i.e., 20 years) would be desirable.
- (f) There should be some means of providing more lead time at the pre-planning stage, for other agencies to ensure better quality decisions are made. (Suggestion: on an informal basis during plan formulation). Consensus at this stage would simplify and speed up the formal approvals. It was suggested that greater emphasis should be put on solving problems and/or seeking compromises at the pre-planning stage, while field work is underway.
- (g) The use of a planning process similar to the concept of the Folio System should be encouraged (or required) in order that all resources and resource uses are provided for in the five-year plan reviews.
- (h) The concept of a "stream management plan" as part of the "logging plan" was proposed, on a stream-specific basis, based on the inventory of the fishery resources.

II. PLANNING GOALS continued

- (i) There should be provisions for field inspections and review of the operation, but it was also suggested that there should be a fixed time that would apply to all but exceptional situations to ease the disruption of the operation.

2. ADMINISTRATIVE ORGANIZATION

- (a) Common administrative boundaries for the Ministry of Environment, Ministry of Forests and the Department of Fisheries and Oceans were suggested to assist in simplifying referrals and resolving jurisdictional problems.
- (b) Cutting permits and Five Year Plan submissions should have staggered submission dates to produce a more balanced workload. (As a further suggestion, Five year Plan revisions could be biennial and staggered with the Cutting Permits, as is being done in the Alberni district).
- (c) A formal review process at the district level, through a District Review Committee, was proposed and a flow-diagram charting this decision making process is included in Appendix 1.
- (d) The ecological differences between and/or within administrative units, i.e., districts, regions etc., should be taken into account and therefore the guidelines need to be developed so as to be interpreted on a site-specific basis.
- (e) It was recommended that a stream classification system for British Columbia be developed, and therefore the Carnation Creek Steering Committee formed a Stream Classification Committee, including: Tom Chamberlin, Mike Brownlee and Doug Morrison. A first draft is to be prepared by August 31, 1983. In addition, a suggested classification system from Working Group 4 based on geoclimatic zones is in Appendix 2.

3. PUBLIC INPUT

It was recommended that public involvement was most effective at the strategic planning level as opposed to the technical planning level. A question was raised as to whether the public is adequately provided for in the management and working plan review processes.

4. AUTHORITY

- (a) The issue of "authority" was raised, and the Steering Committee has suggested that a "Protocol" agreement among the Ministry of Forests, Ministry of Environment, Department of Fisheries and Oceans, and the Council of Forest Industries be drafted following completion of the guidelines. This agreement will seek to formalize each agency's agreement with the guidelines and clearly explain the issue of "authority".

II. PLANNING GOALS continued

- (b) In addition, there was discussion under new initiatives that more responsibility be given to the forest industry to manage both the forestry and fisheries resources.

5. EVALUATION

Within the planning process there should be a guideline revision, evaluation and effectiveness step built in. (There is a fuller discussion on evaluation in the new Initiatives Section).

III. RESOURCE INTERACTIONS

A statement will be drafted on the goals and objectives of the various agencies with respect to the forestry and fishery resources and how they interact.

This statement will precede the specific guidelines for Forestry/Fisheries interactions and a similarly appropriate statement would precede any subsequent Forestry/Wildlife guidelines, and the Forestry/Recreation guidelines, etc.

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES

1. PREPLANNING AND LAYOUT

The new guidelines for preplanning and layout need to include the following:

- (a) That enhancement opportunities be identified at this stage to make better use of equipment and personnel.
- (b) That a technical level workshop be held on the "Rate of Cut" issue, chaired by hydrologists. The major question to be addressed is whether there should be an arbitrary percentage for rate of cut or whether the percentage should be based on the characteristics of each watershed, in each region, including factors such as the size of the watershed, type of stream, soil type, aspect and rain/snow data.
- (c) That resources and habitats of special significance be specifically identified and protected.
- (d) That landings closer than 40 m from the banks of a stream or waterbody be subject to specific approvals.
- (e) That the location of setting boundaries in relation to edges of lakes and valley bottom streams be included, with site specific recommendations for cross-slope streams and gullies.

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES

- (f) That unstable and/or steep slope areas either be deferred from logging or subject to site specific guidelines covering such aspects as partial or selective logging, special stabilization treatments, removal of landing materials, etc.

It was noted that prediction technology and a rating of hazards need to be developed to assist in the logging of unstable and/or steep slope areas.

PAST ACCEPTABLE GUIDELINES INCLUDE:

That different types of forest cover be recognized and deliberately incorporated into area plans. These include:

1. inaccessible trees which occur in steep rocky canyons and on steep bluffs;
 2. tree growth occurring on unstable, erodible cutbanks;
 3. leaning trees along water-courses and shorelines which cannot be removed without causing environmental damage;
 4. fast-growing deciduous trees of suitable species, not subject to extra-site encroachment, planted along water-courses or shorelines whether prior to logging or after slash burning;
 5. filter strips between roads or openings and waterfront or stream banks, held temporarily pending stabilization of run-off within the developed area; (revision required)
 6. forest recreational use development areas;
 7. forest utilized as "surround" for unique features;
 8. forest temporarily held in pocket or strip for recreation areas, pending development and eventual repositioning into alternative areas;
 9. stream-face or shoreline blocks subject to special treatment, stand improvement, or special cutting system.
2. STREAM MANAGEMENT PRACTICES

For each streamtype, specific guidelines will be required, under the following categories. (In some cases previous guidelines which were acceptable to the Working Groups have been noted and itemized under the appropriate category).

IV. SPECIFIC FORSTRY/FISHERIES GUIDELINES continued

A. STREAM BANK MANAGEMENT

1. Temperature:

It was recommended that a temperature range be provided. Guidelines still need to be written with respect to temperature.

2. Deciduous Input (Riparian Vegetation Management)

There is a need to consider the mechanical falling of alder seed sources along streams to encourage sucker and regrowth to enhance stream bank stability.

PAST ACCEPTABLE GUIDELINE

Protect natural growth in and on the banks of lakes and streams from damage from logging and burning.

3. Physical Integrity

(a) That the living root network in the stream bank be recognized.

(b) To recognize that the integrity of the stream can be altered by natural events, such as blow downs.

4. Stability of Large Organic Debris:

(a) Both active and passive large debris management is needed.

(b) The large organic debris needs to be defined in terms of stream type.

(c) The pros and cons of debris grizzlies need investigation.

B. OFF STREAM HABITAT MANAGEMENT

The new guidelines with respect to off stream habitat need to consider work timing, culverting, inventory of these areas, possible enhancement plans, and the possibility of aerial logging techniques. These areas need to be considered as CRITICAL management areas.

PAST ACCEPTABLE GUIDELINES INCLUDE:

1. Leave stream bank cover in an undamaged condition. A well scattered cover consisting of the remaining trees, brush and undergrowth growing on the entire width of the protective strip, with negligible ground and soil disturbance.

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES continued

2. The result desired is to create a protective strip consisting of brush, small healthy trees, and any other snags or trees, such as leaners, which were left standing because they could not be felled and logged without unduly damaging the trees and brush, without creating excessive disturbance to the ground, or otherwise contravening the stream, stream-bed, or lake protection terms and conditions.
3. In the typical case, the outer boundary of the protective strip will be the stream, and the inner boundary will be marked out along a line approximately averaging one chain away from the stream.
4. In other site-specific circumstances, the outer boundary might cross the stream to provide clearance for deflection, etc., or it might be a considerable distance away from the stream, to establish a deferred area, in which case there would automatically be an unlogged buffer strip, as previously mentioned.
5. Where for any reason, the outer cutting boundary is away from the stream, establishing an unlogged buffer strip, then for that part of the stream or lake it should be understood that the outer cutting boundary and the inner cutting boundary coincide.
6. Within the outer and inner boundaries, which define the protective strip, a number of practices must be applied which in total, make the logging of the strip quite different from the logging on the rest of the setting.
7. In the course of preparing such a protective strip, considerable value judgement and close supervision of all logging activities must be exercised.

C. IN STREAM MANAGEMENT

The new guidelines need to address sediment impacts.

PAST ACCEPTABLE GUIDELINES INCLUDE:

1. That a lake, stream or spring that supplies water for any purpose not be rendered unfit for that purpose.
2. That trees, logs, logging debris or any polluting substance not be deposited into a lake, stream, or spring, unless authorized by a Forest Officer. (Further discussion required re: authorization with consultation).

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES continued

3. That logs are not to be skidded or equipment operated below the high-water mark of a lake or stream, unless authorized by a Forest Officer (further discussion needed).
4. That logging, milling and road building debris deposited in and on the banks of lakes and streams, be removed. Revision required to address the impact of small debris and the need for site specific applicability through the authority of the Forest Officer, in consultation.

3. FALLING AND YARDING

PAST ACCEPTABLE GUIDELINES INCLUDE:

- A. That falling and yarding of timber be directed away from lakes and streams and their banks.
- B. That setting boundaries and yarding plans coincide with water courses, so there is no yarding damage.
- C. The protection of water quality (and stream habitat) will normally require care and special measures in falling, bucking and yarding away from the stream or lake, and cutting will not commence until the boundaries have been approved.
- D. On the other hand, subject to the exemption listed below, all trees which can be incorporated into the harvesting plan, whether standing, pushed over or down, must be logged and removed provided they can be logged and removed without excessively damaging the planned remnant stand of trees and brush. That is to say unless exempted from waste assessment in accordance with stream, stream-bed and lake protection terms and conditions of the cutting authority.
- E. To be specific, no tree or snag can be felled into water or log skidded within the highwater level of any stream channel, and no tree or log can be yarded unless it can be either lifted clear of the ground before it is moved, or high-leaded out in the direction in which it was pointing before being moved.
- F. In both cases, it can only be moved out on a track clear of obstructions, and clear of the trees and shrubs which are approved to be left standing in an undamaged condition.

The result of this practice will in fact be a satisfactory protective strip over the whole of the strip as laid out.

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES continued

- G. Every tree felled must be felled in the right direction for yarding using jacks or a linehorse to ensure that it is felled precisely to lead in accordance with rigging layout approved and the pre-planning of tail-block or snatch block location.
- H. Trees which cannot be adequately coped with in this way must be left standing, and if they are improperly felled and bucked, they must not be moved until special arrangements are made to re-rig to meet all requirements to the satisfaction of the Forest Officer.

4. SILVICULTURE

Further discussion is needed to draft specific guidelines on the impact of silviculture activities on stream management (i.e. alder control, site rehabilitation, slash burning).

PAST ACCEPTABLE GUIDELINES INCLUDE:

- A. That slash is not to be burned closer to a lake or stream than the distance specified by a Forest Officer.
- B. That the natural growth in and on the banks of lakes and streams be protected from damage from logging and burning.

5. ROADS

THE DISCUSSION ON THE IMPACT OF ROADS ON THE FORESTRY/FISHERIES RESOURCES LED TO A MORE COMPLETE DRAFTING OF GUIDELINES BECAUSE THE ROADS WORKING GROUP #5 MET FOR A SECOND SESSION IN PARKSVILLE. THE FOLLOWING REPRESENTS A FIRST DRAFT OF THE ROADS GUIDELINES AND PROVIDES AN EXCELLENT APPROXIMATION OF THE FORMAT FOR THE NEW COASTAL LOGGING GUIDELINES.

1.0 Preamble

The following guidelines for logging roads, bridge and culvert construction are intended to minimize environmental impact, reduce the conflict between the various resources and provide for efficient and economic harvesting of the forest.

Planning, location, design, construction and maintenance shall remain consistent with sound engineering practices and safety to achieve an optimum balance between the separate costs of construction, maintenance, logging use and environmental protection.

It is intended that these guidelines will be compiled within most cases. Deviation from these guidelines can be approved by the Forest Officer, after consultation with the Licensee. (Still under discussion.)

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES continued

2.0 Planning and Location

2.1 Planning

- Planners will acquire a sufficient data base to identify other resources.
- Where information is not available this may require an inventory through a cooperative effort to identify the important values.
- Plan roads with due consideration of all resource values on a watershed basis.
- Consider the logging systems and logging pattern to minimize soil disturbance and optimize efficient forest development and harvest.
- Post harvesting roads shall be identified prior to harvesting as either limited access or abandoned.

2.2 Location

- Take advantage of stable benches, ridge tops and gentle slopes.
- Roads shall not be constructed through slide areas or areas with evidence of slope instability unless the alignment is the best alternative and special design features are incorporated into the plan.
- Maintain a reasonable distance from streams, estuaries and active flood plains.

3.0 Design

3.1 Turnouts

- Turnouts as required, preferably intervisible with a useable length of about 30 metres and a total width including road of 10 metres to provide for safe reliable use.

3.2 Widenings

- Widen all curves to allow for side tracking of truck trailer units. On blind curves the road should be at least 8 metres wide around the curve and for 100 metres approaching each end of the curve.

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES continued

3.3 Grades

- Design rolling grades to reduce surface and ditch water velocity.

3.4 Cut and Fill

- Construct cut and fill slopes to suit the local soil and rock material.
- See Form F.S. 650 for some recommended slopes.
- Round off tops of cut slopes to reduce sloughing and surface ravel, when necessary and when using hoe construction.
- On steep cut and fill slopes provide for slope stabilization on sensitive areas, i.e.: terracing, vegetation, cribwork.

3.5 Culverts and Bridges

- Drainage structures include metal, wood, open faced culverts and bridges. Where open faced culverts are used provision must be made for a non-erodible surface. The design must also clearly provide for waterflow across the road. Continuous and intermittent streams shall be identified at the time of road location. All identified channels shall be accommodated by a drainage structure.
- Additional culverts will be installed to reduce ditch water where significant ground water is intercepted along roads (generally on steep slopes).
- Provide adequate drainage at all road junctions.
- Culvert and bridge capacity design will be decided by the expected operational life of the road and the maximum expected flow. In any design the minimum culvert size shall be: not less than 450 mm for metal and not less than 500 mm x 1000 mm for wood. With wood culverts, use mud sills on steep slopes with erodible material.

The following additional guidelines shall apply to all stream crossings of waters frequented by fish.

- Drainage structures shall not encroach on the active stream channel.
- The natural stream bottom shall be maintained under the crossing structure (metal pipes should be partially buried).

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES continued

- Design for adequate drainage ditches and catch basins.

4.0 Construction

4.1 Timing

- Suspend any construction during extremely wet conditions where siltation or debris will threaten fisheries values.

4.2 Equipment

- Preference should be given to the use of backhoes in areas with thick overburden, steep unstable soils, soils with low bearing strength, and in areas of high seepage to minimize sidecasting and erosion.

4.3 Right-of-Way Felling, Clearing, and Subgrade Construction

- Fall all trees within a R/W to a width of 20 metres or more, as required by special terrain features.
- Fall all merchantable timber within 5 metres of the top of the cut and the toe of the fill.
- R/W felling shall be away from fish bearing streams.
- Recover all merchantable logs.
- Do not incorporate stumps or organic material into the subgrade except where overlanding or where corduroying is used in construction.
- Avoid depositing construction debris or sidecast into any waterbody unless approved by the various agencies.
- Subgrade should be adequately ditched and drained during construction.

4.4 Drilling and Blasting

- Blasting should be conducted in a manner which will minimize flyrock from entering any fish bearing stream.

4.5 Ballasting and Surfacing

- Place sufficient ballast or surface material to carry loaded (design load) logging trucks without rutting or deforming the road surface. Give due consideration to the planned traffic frequency, quality of ballast and surfacing materials and required maintenance.

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES continued

4.6 Drainage Structures

4.6.1 Bridges

- Construct bridges which will carry the design load according to accepted engineering principles.
- Satisfy site specific constraints to limit scour, siltation, erosion and environmental damage.
- Satisfy timing constraints for construction.

4.6.2 Culverts

- Culverts shall be laid as near as possible to the natural stream gradient.
- Upstream areas will be left clear of debris to prevent blockage of culverts. Debris catches shall be used where debris movement is expected.
- Ditch deflectors will be used on steep grades to deflect water into culverts.
- Catch basins will be of adequate size to collect debris and gravel to reduce plugging of culverts.
- All end puncheon must be spiked, notched or lashed to prevent sill logs from moving inward and the puncheon from spreading.

4.6.3 Pits and Quarries

- Borrow pits, rock quarries, and spoil sites will be located in areas which are not subject to flooding by fish bearing streams.
- Water drainage from these sites will be controlled to prevent erosion, or other deleterious products from leaving the site.

4.7 Landing Construction

- Guidelines which apply to roads would apply to landings.

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES continued

4.8 Special Circumstances

- Where construction threatens fisheries values special techniques will be employed, i.e.: end hauling, slope stabilization.
- Fuel storage and fueling should be done in a manner to avoid fuel spillage or potential for spillage.

5.0 Maintenance

5.1 Active Logging Roads

- Establish a maintenance program to retain the integrity of the road surface, drainage structures and water quality.
- Intensive maintenance should be conducted prior to long shutdowns and peak flow periods.
- maintenance should include an up-grading of water structures where necessary.

5.2 Inactive Logging Roads

5.2.1 Limited Access Road

A modified maintenance schedule shall be prepared for limited access roads. These roads shall be maintained for light traffic for the purposes of silviculture, fire protection or future development. Long term road stabilization shall include the following:

- Remove culverts that demonstrate a serious maintenance problem.
- Cross ditches shall be cut to further reduce ditch water and re-establish natural flow patterns.

5.2.2 Abandoned Roads

These are roads where no further access is required or anticipated.

- Remove all culverts and road fill material from gullies and stream beds to permit open flow and stable channel conditions.
- Restore natural drainage patterns and deposit excavated material in a stable location.

IV. SPECIFIC FORESTRY/FISHERIES GUIDELINES continued

6. REHABILITATIVE/MITIGATIVE MEASURES

Guidelines on rehabilitation, compensation and mitigative measures are still to be written. The section on new initiatives should be considered separate from the preceding draft guidelines as these subjects still require considerable policy level discussion.

Based on the feedback from government, industry and the public, draft guidelines will be forthcoming. (Please refer to Critical Path for timing direction).

V. GLOSSARY

It was recommended at the workshop that a Glossary be included in the new guidelines. The Stream Classification Committee is presently developing such a Glossary and the first draft is being prepared for August 31, 1983.

* * * *

PART III - ADDITIONAL WORKSHOP RESULTS

I. INVENTORY

THE STREAM CLASSIFICATION COMMITTEE HAS ALSO BEEN GIVEN THE RESPONSIBILITY TO DEFINE INVENTORY STANDARDS AND A FIRST DRAFT IS BEING PREPARED FOR AUGUST 31, 1983.

A. REQUIREMENTS FOR INVENTORY

<u>Requirements</u>	<u>Comments by G. F. Hartman</u>
1. Potential users	
2. Landform terrain mapping -Soils -Slope Stability	Broad-scale mapping
3. Climate and hydrological data	Should indicate the nature and distribution of precipitation (rain/snow).
4. Hydraulic regime	
5. Vegetation typing	This might include the identification of close or available trees to serve as future large debris if needed
6. Biophysical road surveys	
7. Stream location	This used if the definition of stream does not include streams that do not run year round or for full length.
8. Channel locations	
9. Stream corridor soils from hydraulic perspective. Species and size of trees at stream margin and some measure of frequency	Should distinguish not only type of soils but rock v.s. soil and gravel corridor material
10. Large organic debris, including purpose of debris; i.e., energy balance, habitat formation, stabilization of sediments and bedload.	"Purpose" might read "role". "Habitat formation" might read "structuring channel diversity and forming cover"
11. Fish presence or absence	Should read "species of fish, general distribution and some estimate of population dimensions".

I. INVENTORY continued

<u>Requirements</u>	<u>Comments by G. F. Hartman</u>
12. Estuary map, to include ponds and side channels	To indicate role of estuary and potential for enhancement
13. Barrier mapping - Location, size and structure.	
14. Fisheries restoration and enhancement prospects relative to fishery stock status	"Relative to fishery stock status" meaning is not clear

B. RESPONSIBILITY FOR INVENTORY

1. We must standardize stream inventory data as done in Washington and Oregon. Government fisheries agencies should set the standards for inventory. Consistent inventory would improve:

- quality of referral comment
- agency-industry negotiating and on-site time
- improve planning
- help reduce the "second look" now needed.

B.C.F.P.'s Stream Inventory For Forest Land Use Planning - A Guide was introduced and recognized as a "starting point".

2. Coordinate inventory with Ministry of Forests computerized mapping. Use all available sources to collect inventory; i.e., industry, agencies, users, consultants, etc. Inventory collected must be available to all users; D.F.O., B.C.M.O.E., B.C.F.S., Industry, etc.

THERE WAS CONSIDERABLE (AND HEATED!) DEBATE ON WHO WAS RESPONSIBLE FOR INVENTORY AND WHO SHOULD PAY FOR INVENTORY. THIS ISSUE REMAINS UNRESOLVED, AND THE OPPOSING VIEWS ARE PRESENTED FOR YOUR REVIEW.

Who is Responsible?

1. Companies will have to take up the responsibility for inventory. Inventory should become a mandatory part of development planning.
2. Industry sponsored but in cooperation with resource management agencies.
3. Companies can do stream inventory while taking forest inventory.

I. INVENTORY continued

Who Pays?

1. There needs to be a clear policy to allow fundings for comprehensive biophysical inventory on Crown lands.
2. Government should pay the cost of inventory.
3. Use Section 88 funds for company or consultants for Cutting Permit fine tuning.

II. RESEARCH

THE RESEARCH NEEDS RAISED AT THE WORKSHOP HAVE BEEN REVIEWED, SUMMARIZED AND PRIORIZED BY G. F. HARTMAN, AS FOLLOWS:

The following is a statement about:

- (a) The requirement for an inter-disciplinary research steering group or some structure that monitors on-going research and provides assistance and direction to the projects.
- (b) The requirements for further research.

In this statement the research needs have been put into a scale of priority. The wording about requirements has been expanded from that which was developed by the working groups at the Parksville meeting. The priorities are based on the judgement of G.F. Hartman. The listing deals only with ideas from the Parksville meeting. It is not a full statement about the spectrum of research work that might, more ideally, form part of the basis for watershed management decisions. Further, ideas about research needs are given in Some Implications of Carnation Creek Research Results to the Process of Forest Planning Guideline and Protection Clause Review, by G.F. Hartman and J.C. Scrivener. Jan 1983. 35p.

A. ORGANIZATIONAL REQUIREMENTS

There is a need for an inter-disciplinary group to assist in providing direction and practical assistance to research workers involved in watershed and fisheries-forestry studies. Such a group would meet on a regular basis and be briefed on the progress of active studies by selected representatives from the agencies and companies involved. The group would consider the work and offer practical assistance and direction regarding the studies. They might also serve as the focus for generating new inter-disciplinary studies, finding funds for them and structuring the working teams to carry them out.

II. RESEARCH

(If this kind of structure is organized, serious consideration should be given to the form of agreements for inter-disciplinary studies started, the continuity of support in both dollars and work-time, the maintenance of data files and report write up.)

B. RESEARCH REQUIREMENTS

A review of the requirements listed and a consideration of the discussions heard suggests that many people see the need for information that relates to forest harvest in steep slopes and in the mid to high elevation sites. One group of research needs relates to such situations. PLEASE NOTE: The highest priority research needs are marked with 3 asterisks, the second highest with 2 asterisks, the third highest with one and the fourth highest with none.

1. Steep slope and mid to high elevation research needs

- *** a) Development of inventory techniques to identify areas of high instability, particularly in steep slope and mid to high elevation areas.
- *** b) Development of the ability to predict responses of such unstable slopes to specific kinds of forest harvest practice.
- ** c) Studies on the effect of clear-cutting on the patterns of run-off and stream discharge in situations where rain or snow storm events are regular or frequent. This concern applies particularly to steep slope situations.
- *** d) Development of the ability to predict the capacity of a steep slope channel (that only carries water in some seasons or conditions) or a steep stream to carry debris, gravel, and/or sand downstream to fish bearing parts of a watershed.
- *** e) Development of the ability to predict the probability of debris, sand and/or gravel moving in such a channel or stream.
- * f) Determination of the feasibility of removing potentially unstable materials from landings on steep slopes.
- * g) Development of efficient and cost effective methods of debris clean up. (G.H. presumes that this applies to steep slope areas and lower, flatter areas alike.)

II. RESEARCH continued

2. Streamside treatment-related research needs

- ** a) The contribution of large trees to large organic debris in the system. (This is understood. However, if the topic implies the need to understand the responses of stream side leave strips in different kinds of sites and the site conditions required so that such leave strips provide bank stabilization and large debris input over a long period or time, it is important.)
- *** b) The relevance of alder seed tree removal to the prevention of re-seeding of alder in planted clear-cuts.
- ** c) The stability and strength of living root net-works in stream-banks and their role and contribution to bank stabilization and fish cover. (I added fish cover as a role.)

3. Off-channel rearing habitat research.

- ** a) The role of off-channel rearing in different kinds of watersheds.
- * b) A more comprehensive look at which species use such habitat.
- * c) The patterns of entrance and exit from such habitat.
- ** d) The opportunities for enhancement. (I have taken the liberty of expanding this topic in more specific studies.)

4. Studies on the effects of sediment on fish

This topic, too, might be expanded into more specific sub-topics.

- ** a) Lethal effects
 - particle size effects
 - particle hardness effects
 - concentration effects
 - concentration/duration effects
 - species, season and age effects
- ** b) Physiological effects of sub lethal exposures.
- ** c) Effects of sediment on food organisms and their production.
- ** d) Effects of sediment on fish feeding.
- ** e) Effects of sediment on rheotactic behavior.

5. Road stabilization studies

Research on road stabilization by driving steel rods into clay cut banks.

II. RESEARCH continued

6. Research on rate of cut effects

It was not spelled out in the working group papers what this might apply to.

- a) Effects on hydrology.
- b) Effects on stream temperatures.
- c) Effects on sediment release.

III. EDUCATION AND TRAINING

A. THE PROBLEM

1. Fish and forest staff lack adequate understanding of guidelines, logging methods, costs, falling, road construction.
2. Industry operational staff lack appreciation of stream habitat. A very major (the major) problem. Also the reverse is true, fisheries staff poor understanding of logging methods and costs.
3. The forestry/fishery schools don't introduce the reciprocal point of view. Especially fisheries students.

B. REQUIREMENTS

1. Implement programs to inform resource extractors of the concerns of other resource users, the constraints that recognize the concerns and the opportunities for accommodating other resource uses. To do this have in-service, continuing educations addressing management concerns; make it mandatory.
2. Forestry short courses for fisheries people and fisheries short courses for foresters.
3. Introduce basic courses on land management and watershed processes to fisheries curriculums.
4. Develop programs for joint agency training on guidelines.
5. Arrange for personnel interchange.
6. Education and training to improve communication between groups.
7. Hold workshops.
8. Hold annual workshops - report on in-service education and training at these workshops.
9. Hold traveling road-shows in each district.

III. EDUCATION AND TRAINING continued

10. Encourage staff talks in courses
11. Recommend workshops of all the disciplines involved.
12. Programs and opportunities for all involved to disseminate information derived from practical experience (*should reach all levels in different groups).
13. Develop a stream habitat awareness program
14. Develop programs to inform resource extractors of concerns, constraints and opportunities for accommodating other resource users.
15. Develop handbooks for field staff
16. Large manuals don't work; are not read by supervisors let alone crews.
17. Develop video tapes, etc., that C.O./F.O. can take with them to camps.
18. Organize sources of references and references within districts.

IV. NEW INITIATIVES

A. EVALUATION OF GUIDELINES

There was consensus by all that there was a lack of evaluation on the adequacy and efficiency of existing guidelines. This is usually due to the fact that other priorities dictate other activities be done first.

Evaluation should be an on-going process applied universally, rather than a "one-shot" study. Evaluation procedures might best be included in the operational plan. Again, a common data base is essential to such a procedure since there must be agreement about what is being evaluated. There must be a commitment by agencies to suggest the costs and logistics of the process.

All the material collected during such evaluations should be made available on a wide basis so that companies and agencies can benefit. There is a need for an on-going process (such as the Parksville workshop) to ensure that results of such evaluation are passed on. Manuals probably don't work as a source of information.

IV. NEW INITIATIVES continued

RECOMMENDATION:

To capitalize on the research capability which exists at the present time, there should be an inter-disciplinary committee which advises on research priorities for the benefit of government research institutions.

There is some consensus that the basis for evaluation should be the Cutting Plan. Only a percentage of all prescriptions would be evaluated, but these should be "typical" cases. Downstream effects should also be considered, not simply on-site factors. Some things would be easy to evaluate, such as endhauling and leavestrips, while items such as clearout and setting details would be more difficult.

B. STANDARDS VERSUS PRESCRIPTIONS

There is considerable current thinking that the forest companies should be given a set of standards to work to, as opposed to the present site-specific referral process. Others feel this is a good direction to work toward as it increases the company's flexibility, but we are not ready for the concept yet. Our present on-site inspection system pushes up alot of detail that proves valuable.

A basic premise of the application of standards would have to be the existence of a common information base that all agreed upon. A second requirement would be the need for extensive post harvesting monitoring. These factors would necessitate joint training programs between industry and government to establish common levels of experience and expertise.

Again, difficulties would be encountered with small companies. There is the added difficulty in describing standards that would fit each site-specific situation encountered in the field.

A possible intermediate step may be to have the companies hire people to produce their own site-specific prescriptions with minimum government involvement. Such a process would be subject to audit by peers and regulatory agencies.

C. COMPENSATION

Prevention of damage is preferable and this should not simply be an "alternative" to avoiding damage in the first place. Again, the hierarchy should be:

1. Protect
2. Restore
3. Compensate

IV. NEW INITIATIVES continued

Compensation, then is the least desirable, "last resort" alternative, but there are situations where it will be required (1) an anticipated risk is known and intentionally taken and (2) accidental damage occurs.

At the present time, compensation is a contentious issue and requires some policy decision by government. If the concept were to be seriously applied, possible changes in legislation may be needed.

The concept would be difficult to apply to small operations, with short-term tenures. Such a situation may require a performance deposit. It should be a cost over and above stumpage so there would be an incentive to log better.

The proper administration and expenditure of compensation monies poses many problems. In the first instance, there should be a priority of where money is spent:

- (a) on site for natural production
- (b) on site for artificial production
- (c) off site for natural production
- (d) off site for artificial production

There is a problem with the determination of liability, especially after the operator has left, and in the actual evaluation of the losses incurred. Off-site compensation would be difficult due to limited tenures.

Several vehicles could be used to administer compensation funds, among them the existing habitat Conservation Fund.

D. REHABILITATION

General Consensus:

There is the possibility of rehabilitating some streams, but it is not a concept that can be universally applied. The best prescription is still prevention, and any subsequent action should be put into perspective of:

- 1. Protect
- 2. Restore
- 3. Compensate

Rehabilitation should not be addressed as a penalty, but as simply another good management practice. Where miscalculations result, and errors occur, rehabilitation could be a method to avoid confrontation. In the extreme case, industry could be given the option of logging carefully or expending funds to rehabilitate, where such was shown to be a sound ecological option.

IV. NEW INITIATIVES continued

Biophysical Concerns:

Depending on physical factors, some streams can be rehabilitated, or in some cases, the stable portions of streams can be rehabilitated. However any work in the stream must be done with some knowledge of the upslope limitations and other activity that may be taking place in the same stream. Slope and soil rehabilitation may be required in conjunction with any stream rehabilitation. In the final analysis, any rehabilitation work should be outlined in the context of planning for the whole basin or watershed.

Planning for rehabilitation could take the form of leaving leaners, conky trees, etc., for placement later as "large organic debris". Working plans should include stream management plans with rehabilitation prescriptions.

Financial, Administrative and Tenure Concerns

Some rehabilitation might be appropriate during logging but may be more feasible after the tenure (responsibility) has expired. There is clearly a problem with the short-term "small" operation. Some management responsibility would have to be delegated to industry to make the concept succeed - incentives are needed. The lack of agency people is a problem, so goals would have to be jointly established and much of the work left to industry. It is accepted that the effort required would be labour intensive and costly.

Costs could be an integral part of normal operational expenses. The actual benefit/costs would be difficult to evaluate and only obvious over the long term. Funding for such rehabilitation could be modelled after the silvicultural fund principle. Another alternative is the use of federal "employment" funds to place logs, boulders, build gabions, etc.

E. PUBLIC CONCERNS

Many of the concepts outlined in this discussion depart radically from traditional approaches to forestry and fish protection. As such, discussion with the public must play a major part of any further guideline development or new initiatives. The Steering Committee intends that this will be vigorously pursued.

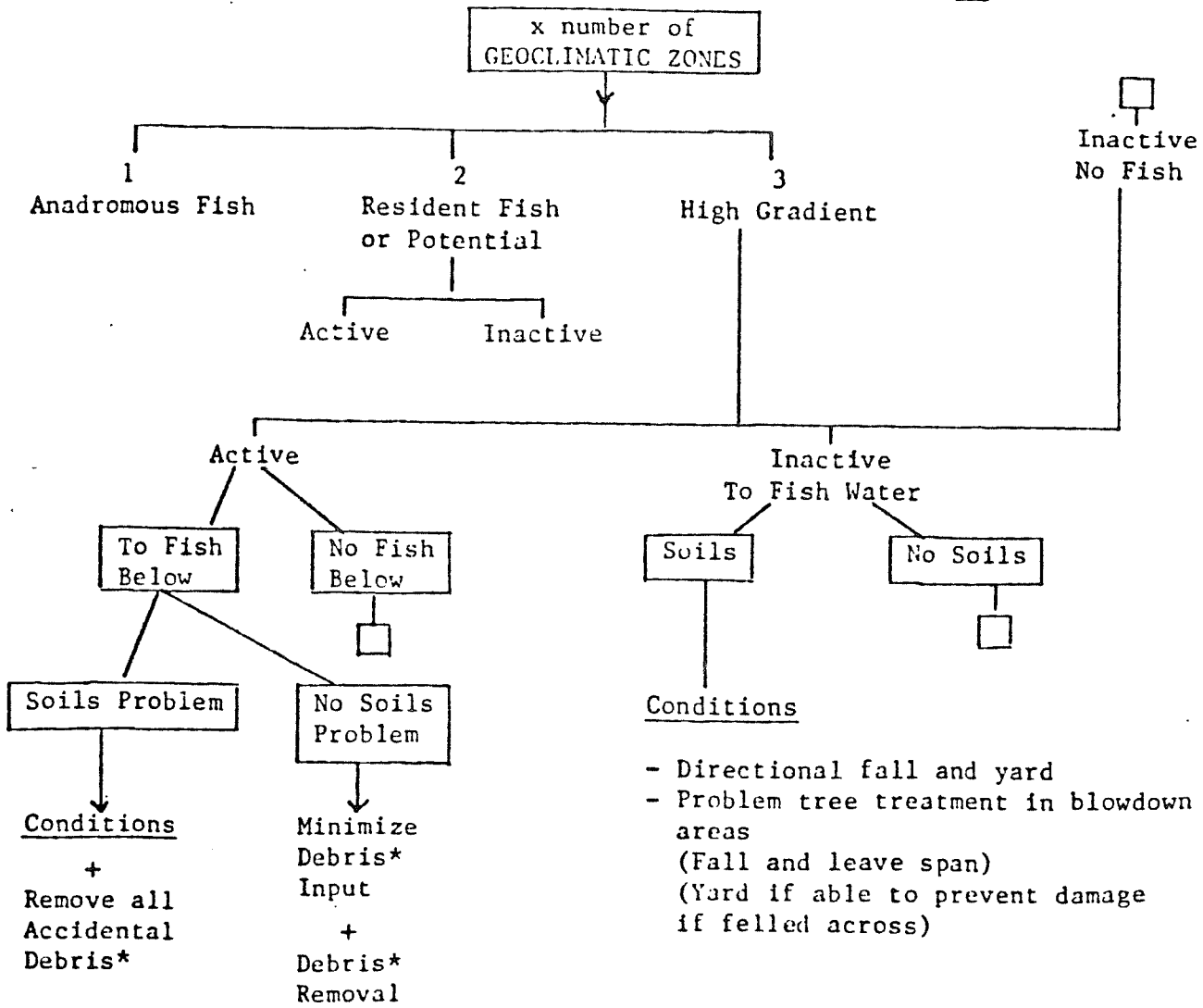
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APPENDIX I

A stream type classification system as suggested by Working Group #4.

- This framework is based on basic geoclimatic zones, primarily used to split areas for the purposes of the guidelines. There are 3 basic stream types and 2 basic types of hydraulic activities included.

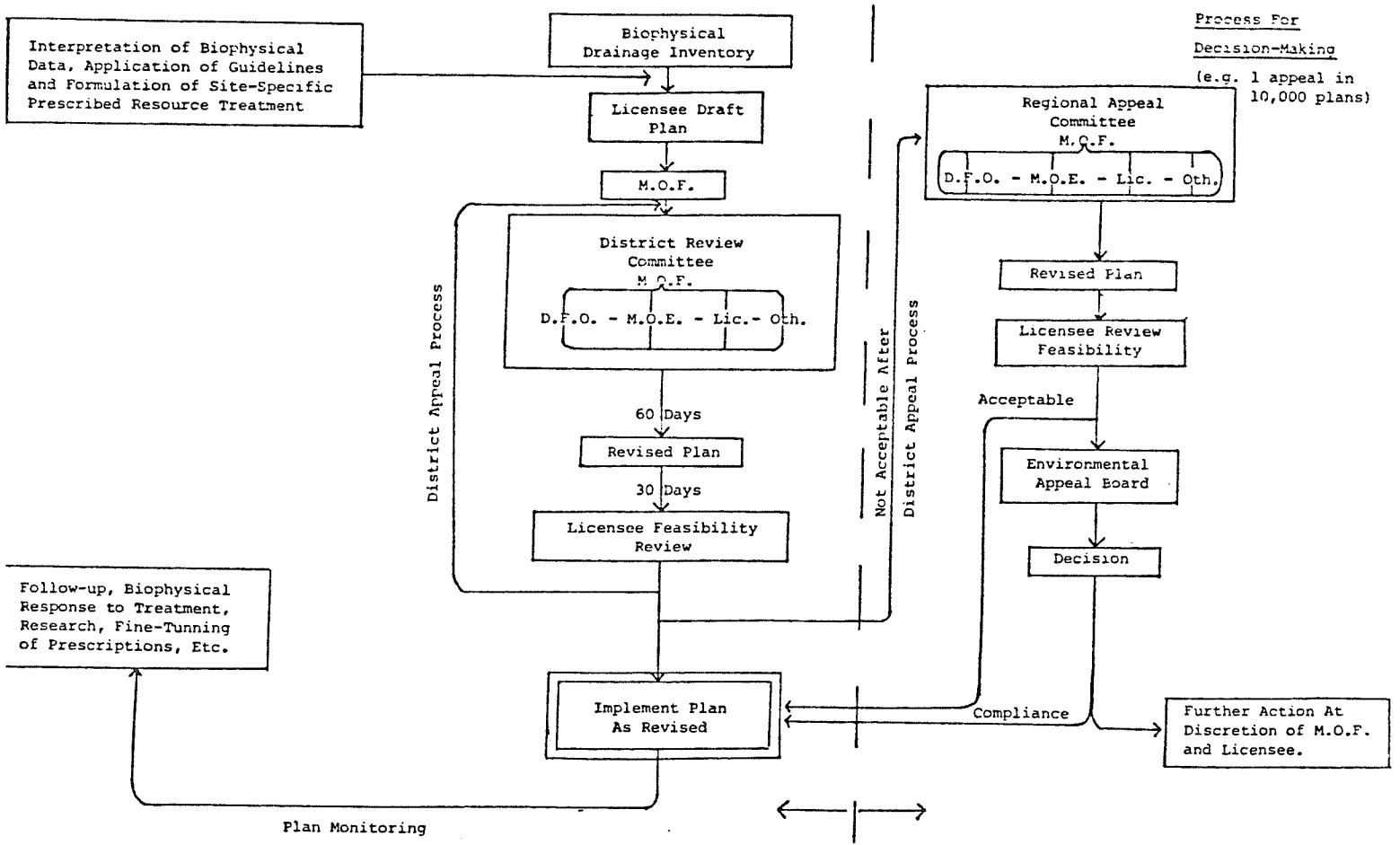
No Conditions



* Debris definition and level of clean-out required. (i.e. standards of removal - machine, hand)

APPENDIX II

The following represents a decision-making process, as recommended by Working Group #1.



APPENDIX III: LIST OF PARTICIPANTS

1. MINISTRY OF ENVIRONMENT

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2. MINISTRY OF FORESTS, continued...

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