

*Shorekeepers' Guide
for Monitoring Intertidal Habitats
of Canada's Pacific Waters*



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Canadian Cataloguing in Publication Data

Jamieson, Glen S., 1946 -

The shorekeepers' guide for monitoring intertidal habitats of Canada's Pacific waters

"The Shorekeepers' Guide is a protocol for non-professionals to map and survey the intertidal zone"—
Abstract.

Contents: Module 1: Mapping and surveying intertidal habitats; Module 2: Information management;
Module 3: Training curriculum for instructors.

ISBN 0-662-27661-2

Cat. no. Fs23-364/1999E

1. Intertidal ecology—British Columbia—Pacific Coast—Handbooks, guides, etc.
2. Seashore ecology—British Columbia—Pacific Coast—Handbooks, guides, etc.
3. Pacific Coast (B.C.)—Environmental aspects—Handbooks, guides, etc.
4. Environmental monitoring—British Columbia—Pacific Coast—Handbooks, guides, etc.

I. Levings, Colin D.

II. Smiley, Brian D.

III. Canada. Fisheries and Oceans Canada

IV. Title.

QH541.5S35J35 1999 577.7'407 C99-980143-0

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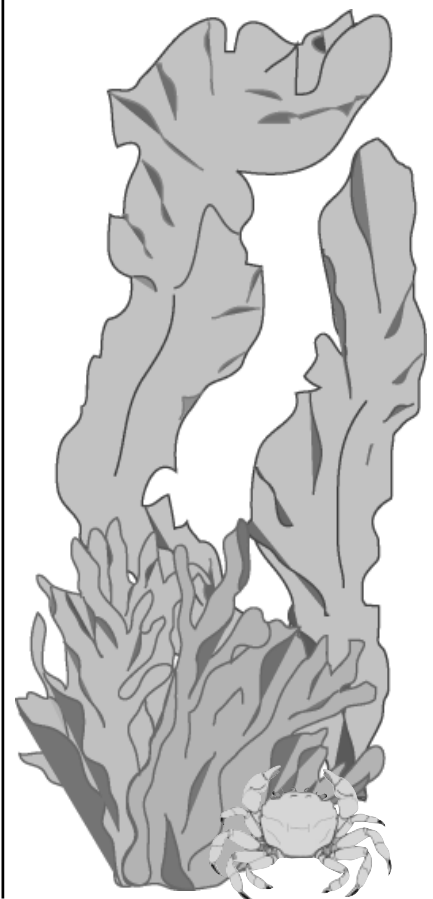
Correct citation for this publication:

Jamieson, G.S., Levings, C.D., Mason, B.C., and Smiley, B.D. 1999. The shorekeepers' guide for monitoring intertidal habitats of Canada's Pacific waters. Fisheries and Oceans Canada, Pacific Region. Modules 1, 2, and 3. 1 Vol. (Looseleaf).

ABSTRACT

The Shorekeepers' Guide is a protocol for non-professionals to map and survey the intertidal zone, and to produce data of sufficient quantity and quality for use by resource managers, environmental biologists, and marine researchers who are monitoring and assessing long-term changes in marine communities. The goal is to enable interested non-professional individuals and community groups to obtain standardized, credible data over time from a specific physical site — and from these data, to document and evaluate the nature of change, if any, that is occurring. The protocol uses both physical substrate characteristics (e.g. sand, mud, and rock boulders) and biological features (e.g. rockweed and eelgrass beds) to define and map habitats, which are then sampled for species diversity and abundance. The protocol can be used on both soft and hard intertidal substrates, and includes a descriptive method for backshore surveying within 20 m of the intertidal zone.

The Guide is comprised of three modules: a mapping and survey procedure, a data management procedure, and a training curriculum to teach leaders about the survey protocol and data management procedures.



RÉSUMÉ

Le Guide des Gardiens du littoral est un protocole destiné à aider les non-professionnels à faire des relevés et à cartographier la zone intertidale, en produisant des données dont la quantité et la qualité sont suffisantes pour qu'elles soient utiles aux gestionnaires des ressources, aux biologistes de l'environnement et aux chercheurs en biologie marine qui surveillent et évaluent les modifications à long terme des communautés marines. L'objectif est de donner à des personnes ou des groupes communautaires, qui ne sont pas des professionnels, le moyens de recueillir sur une période assez longue des données normalisées et fiables sur un site particulier – et, à partir de ces données, de documenter et d'évaluer la nature des modifications éventuelles qu'il subit. Le protocole utilise à la fois des caractéristiques du substrat physique (sable, vase, blocs de rocher, par exemple) et des caractéristiques biologiques (herbiers de fucus ou de zostère, par exemple) pour définir et cartographier les habitats, dont l'échantillonnage permet ensuite d'étudier la diversité et l'abondance. Le protocole peut servir pour les substrats intertidaux mous aussi bien que durs, et comporte une méthode descriptive pour faire le relevé de l'arrière-plage dans les 20 mètres de la zone intertidale.

Le Guide se compose de trois modules: procédure de cartographie et de relevé, procédure de collecte des données, et module de formation pour apprendre aux responsables à appliquer les procédures.

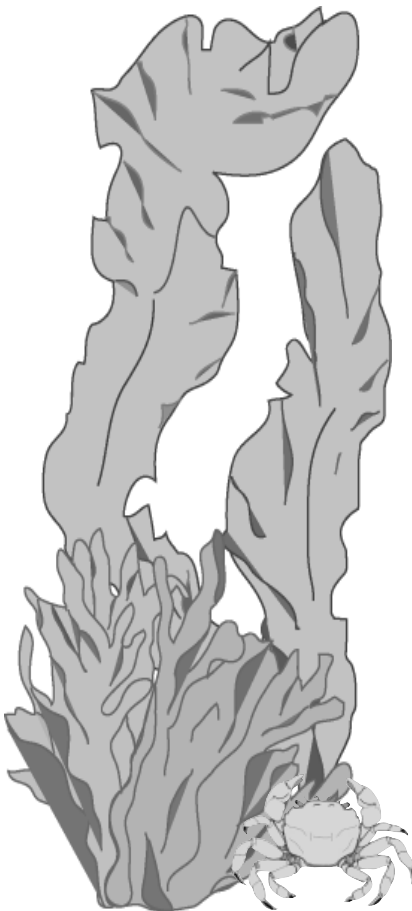


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ACKNOWLEDGEMENTS

Funding for this Guide has come from the Department of Fisheries and Oceans (DFO) Pacific Region (Science Branch), DFO Oceans Act Implementation Fund, DFO Oceans Directorate, DFO Science and Technology Youth Internship Program, Human Resource Development Canada, Habitat Restoration and Salmon Enhancement Program, and the Nanaimo Labour Community Fisheries Habitat Development Society (LCFHDS).

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FIELD SURVEYS - 1997

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BACKGROUND AND INTRODUCTION

In January, 1997, Canada's Oceans Act was passed. This Act expanded the mandate of the Department of Fisheries and Oceans (DFO). In the past, the status of individual fish species has been largely monitored in isolation both from other species and their ecosystem. The Oceans Act now requires DFO to initiate an integrated and co-ordinated ecosystem-based approach to managing our ocean's resources, where species and habitat issues are evaluated in the context of their relation to other ecosystem components around them.

Such an approach will often require collecting data not just on managed species but rather on a wider variety of species that live in the same habitat and that may be connected ecologically to the managed species. More focus will now be directed on acquiring scientific knowledge about the natural relative abundance and spatial distribution of a variety of species that live in a habitat, and the impacts that human activities are having on them.

This demand for new information has come at a time when governments everywhere are reducing their expenditures, yet also at a time when local people and communities want greater involvement in decision-making processes. Decision-making implies assuming responsibility, and participation here is enhanced when the understanding of issues is obtained by direct involvement in field studies. Thus, there is now considerable opportunity and need for community groups and individuals to work with DFO's science staff to obtain new knowledge about our marine ecosystems.

It is the need for a new data acquisition approach that stimulated development of this Shorekeepers' Guide. The Guide has been modelled in part after the goals of the successful Streamkeepers' Program, a combined federal and provincial initiative designed to help non-professional community groups and individuals in British Columbia contribute significantly to preservation, protection, and enhancement of freshwater habitats. The methods used in the Shorekeepers' Guide are based loosely on the approach described in the DFO Coastal and Estuarine Fish Habitat Description and Assessment Manual, completed in 1993. However, the Guide differs from this Manual and most other regional approaches in that the Guide uses both physical substrate characteristics and biological features such as rockweed and eelgrass beds to explicitly define habitats.

From 1996 to 1998, there were three major field testings of the Shorekeepers' methods and materials, with each leading to significant improvements or adjustments in the methodology described here in the Guide. Trials mostly occurred between Ladysmith and Denman Island, off south-eastern Vancouver Island, and thus the species listed in this Guide are those most likely to be found in Strait of Georgia marine communities. Additional lists, and in some cases even habitat types, for different geographical areas may be made available in the future; these will be added as new appendices.

There are a number of other intertidal monitoring protocols available to the public, but the goals and objectives of these protocols vary considerably. Many are focused more on education rather than the long-term provision of usable data. Groups interested in monitoring their marine environment should investigate all protocols before choosing an approach that they feel best suits their needs and monitoring capabilities. It is important to maintain familiarity with the available protocols, because their methods and materials may be modified over time as conditions change and new protocols may be developed.

If you choose this protocol, please stay in contact with your DFO representative so that any updates to this version of the Guide can be made available to you.

Some features of the Shorekeepers' Guide that set it apart from most other existing protocols are:

- Data credibility is high for use by resource management agencies;
- Procedures and systems are established for both data maintenance and accessibility by participating community groups; and
- Leader training procedures and technical support services are available to minimize problems.

ORIENTATION TO THE GUIDE

WHAT IS THE SHOREKEEPERS' GUIDE?

The Shorekeepers' Guide has been developed in response to growing concern about the impacts of human activities on marine life in British Columbia. Right now over 2 million people in BC live on the coast, and in the future this number is expected to grow faster than in the past. Surface runoff from urban areas and farms, human sewage, industrial discharges, logging, fishing, fish farms, clam digging, breakwaters, and even foot traffic on beaches can cause changes to the characteristics of intertidal communities.

Three modules comprise the Shorekeepers' Guide. The first two demonstrate how to set up and conduct surveys to monitor intertidal plant and animal communities, and how to organize and enter your data to the Shorekeepers' database. The third module is a two part curriculum to train volunteers both in how to conduct a survey and how to manage the data obtained.

WHO CAN USE THIS GUIDE?

You may be concerned that a nearby industry is affecting the plants and animals on a particular shoreline; that the ecology of a particular shore is being affected by harvesting; or that the abundance of a few particular plants or animals appears to be changing. This Guide is intended for both professionals and non-professionals who would like to monitor the health of shores in their area and need a tool to do so. Participants may be volunteers, members of a community environmental group, or a senior high school class. Participants should be able to commit several full days each year to survey a site, be prepared to learn the survey techniques, which are rigorous and require some math. They should be interested and willing to learn how to accurately identify a large number of intertidal plant and animal species.

SURVEY TRAINING

To make a Shorekeeper survey easier and its resulting data useful, participants are encouraged to take a training course. Module 3 presents a detailed course curriculum so that individuals with professional training in marine biology can develop a training course for non-professionals who wish to conduct Shorekeeper surveys in their area. If you are interested in taking the Shorekeeper course or in hosting a course, contact a DFO representative.

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WHERE DO THE DATA GO?

Data collected from each Shorekeeper survey are first recorded on data sheets while in the field. They are then entered into the Shorekeepers' database. This is a multi-level computer database with explanatory screens that show how and where to input the data. Volunteers can receive summary reports of their data directly from the database. DFO representatives who maintain the database will analyze and report these, and other data, to look for long-term trends in intertidal habitat characteristics.

HOW TO USE THIS GUIDE

Module 1 has been written in an easily understood step-by-step manner to guide a user through each step of a survey. First read through Module 1. Contact a DFO representative to discuss your interests and to obtain information about the status of Modules 2 and 3B. Module 1 will be your guide when you actually do a field survey. Module 2 will be your guide to data entry. If you plan to be an instructor for a Shorekeeper surveying and mapping course, then you will need Module 1 and Module 3, Part A. If you plan to be the instructor for a Shorekeeper data management course, then you will need Module 2 and Module 3, Part B.

DESCRIPTION OF THE MODULES

Module 1: Mapping and Surveying Intertidal Habitats

This Module describes in a step-by-step manner how to proceed from selection of a survey site through the entire process of mapping and surveying that site. You will document your concerns about the area and collect relevant maps or charts that encompass the area. You will assemble a survey team and select survey dates. You will map the habitats in your study area and take physical measurements of the slope and elevation. Then you will lay out quadrats within which you will identify and count or estimate each different species of plant and animal.

Time commitment: 2 days per year (minimum).

No. of people required: 5 or 6 per survey team.

Time of year: Spring or summer months when tides are low during the day.

Training: A Shorekeepers' surveying and mapping course should be completed by at least one member of the survey team (and preferably more) who will then act as leader to ensure that all aspects of the survey are completed correctly. Any team members who have not taken the course should be completely familiar with the survey methods in Module 1 before beginning the survey; they also should be able to identify the species of plants and animals likely to be encountered at the selected survey site.

MODULE 2: INFORMATION MANAGEMENT (in preparation)

This Module describes the Shorekeepers' database. It provides a step-by-step guide to using the database, entering different types of data, and producing data summary reports about your survey.

Time commitment: 1 day per year.

No. of people required: 1 to 2 per survey team.

Training: To use the Shorekeeper database and complete the data entry, you should be familiar with Microsoft Access. If you are not familiar with Microsoft Access, then training may be necessary.

MODULE 3: TRAINING CURRICULUM FOR INSTRUCTORS

Part A: Curriculum for Module 1: Mapping and Surveying Intertidal Habitats

Part A of this Module is for individuals who intend to develop and offer a Shorekeeper surveying and mapping course. Such individuals should have professional knowledge about intertidal ecology and should have some experience surveying and mapping. The module describes the information that needs to be presented and learning outcomes, and also suggests how to present information.

Course duration: 24-hour instruction over 2 to 5 days.

MODULE 3: TRAINING CURRICULUM FOR INSTRUCTORS

Part B: Curriculum for Module 2: Information Management (in preparation)

Part B of this Module is for individuals who intend to develop and offer a Shorekeeper data management course. Such individuals should have experience using Microsoft Access databases. The module describes the information that needs to be presented and learning outcomes, and also suggests how to present the information.

Course duration: 3 to 4 hours.