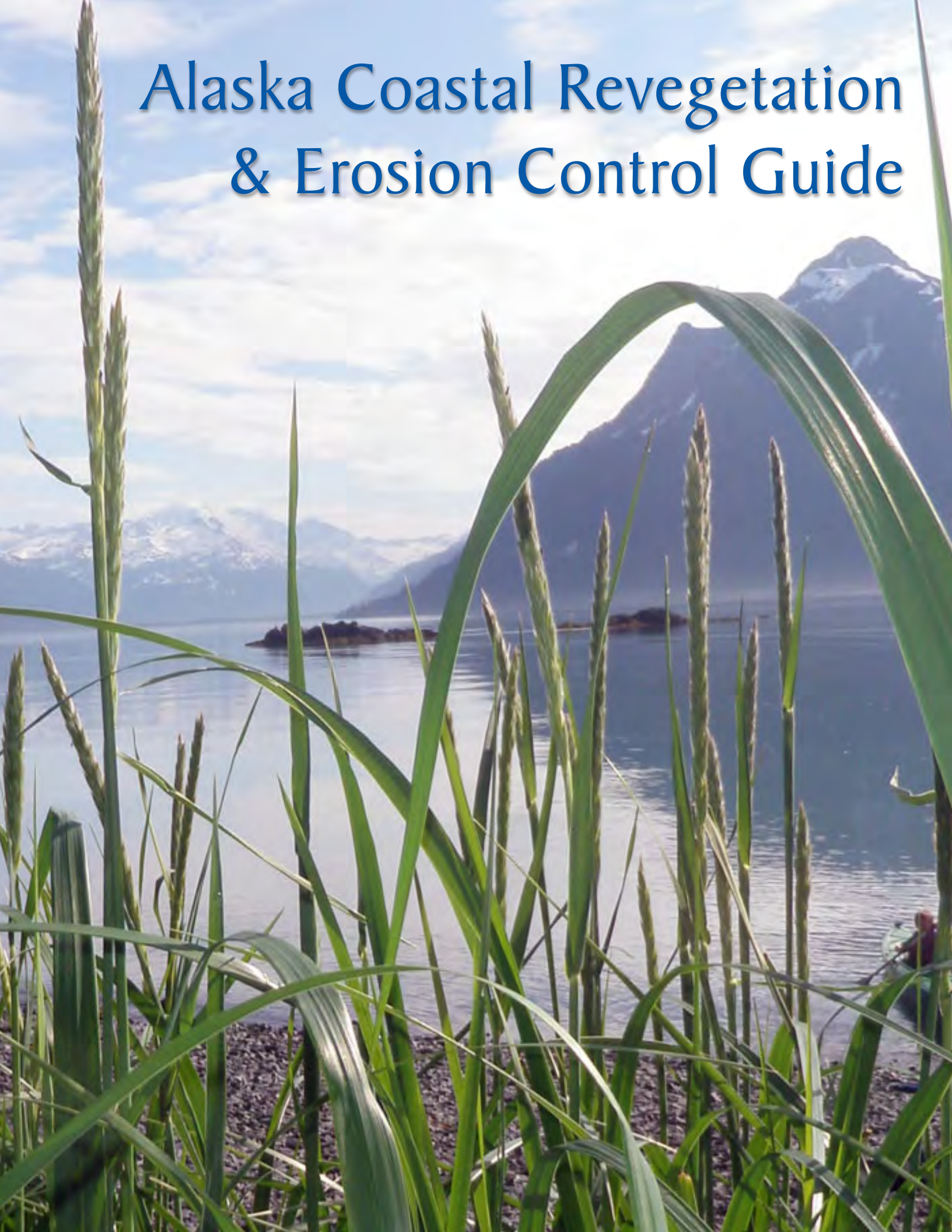
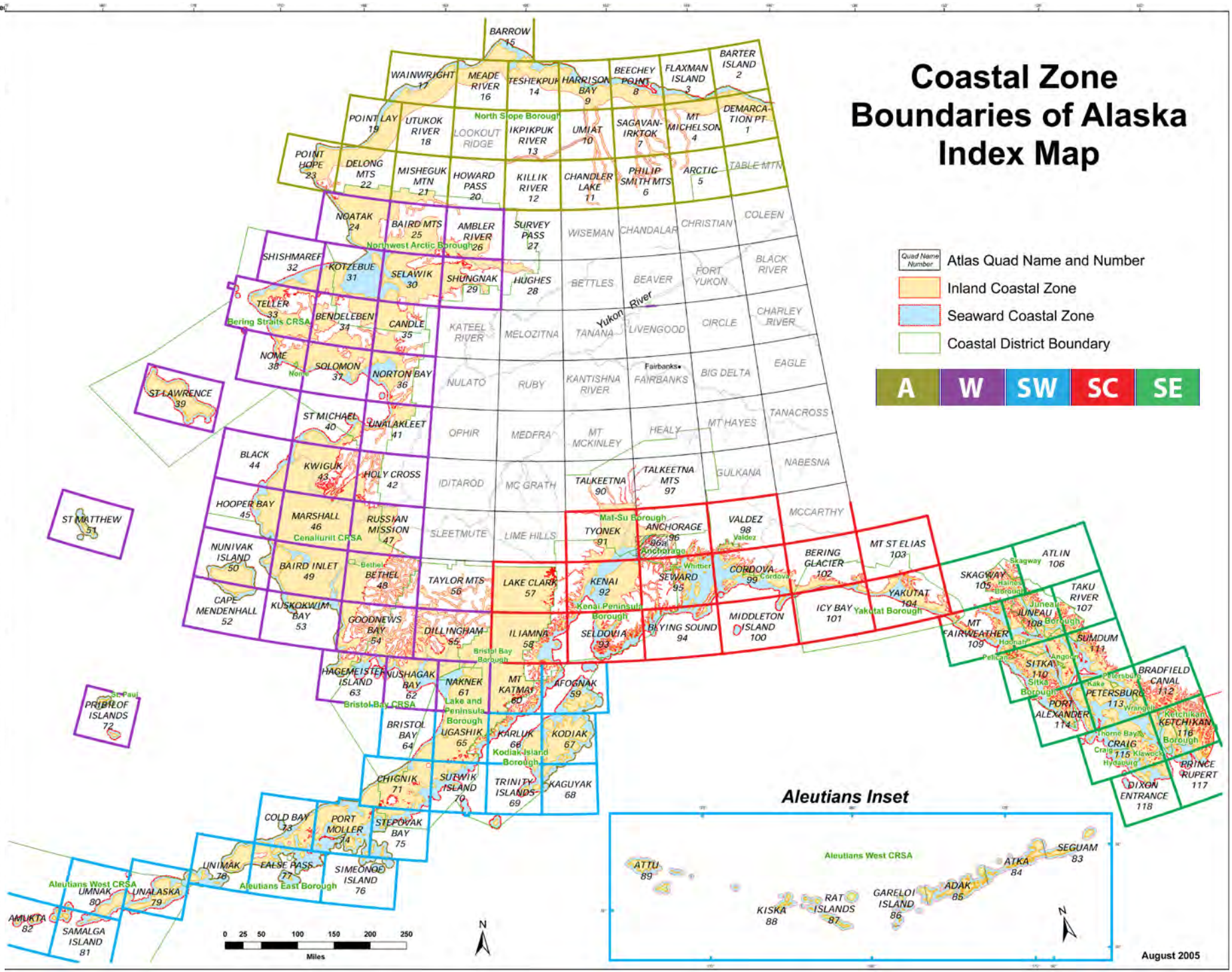
Alaska Coastal Revegetation & Erosion Control Guide



Coastal Zone Boundaries of Alaska Index Map



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Alaska Coastal Revegetation & Erosion Control Guide

By

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and

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Front Cover: A natural stand of Beach Wildrye in southeastern Prince William Sound

Photo: Brennan Veith Low (AK PMC)

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Foreword

STATE OF ALASKA

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Dear Alaskans,

Born and raised in Alaska, from a long-time Alaskan family, I love our great state. The immense grandeur and unrivaled landscape provides an abundance of natural resources that have provided for the development of Alaska as well as vistas that nourish the Alaskan spirit. I know Alaskans will continue to responsibly develop our resources, while also conserving and enhancing the natural environment for future generations. Commercial fishing, logging, mining, tourism, oil & gas production, and transportation are vital industries to Alaska and make up a large part of the state's economy. However, these activities can create disturbances that impact the natural wealth of Alaska. Proper stewardship dictates that these impacts be addressed.

Coastal areas are especially sensitive to disturbance, and especially at risk for erosion. As most of our population centers are near the coast, these areas deserve special attention. The human footprint need not cause negative environmental impacts. Reestablishment of a native vegetation cover by surface preparation, seeding, and fertilizing is a method of erosion control that is cost effective and has a high success rate.

Throughout my career with the Alaska Department of Natural Resources (DNR), I have promoted responsible resource exploration and development. This includes the restoration of previously disturbed areas to their natural condition. The State of Alaska now takes the initiative and mitigates ecological impacts as they occur. This guidebook provides Alaskans a reference for coastal areas and, as such, supports the growing awareness and action occurring in coastal revegetation today.

The reintroduction of vegetation is a proven method of erosion control, and can enhance the aesthetic value of an area as well. We hope that those Alaskans undertaking revegetation or erosion control projects will find this guide useful. The guidebook includes case studies, making it unique, and helps to move forward the art and science of revegetation. Projects from each climatic region of Alaska are represented, providing details of methods and species used, as well as results and lessons learned. These case studies will serve as a helpful reference in the design of any revegetation project.

DNR and I would like to thank you for your interest in revegetation and your commitment to keeping Alaska healthy and vibrant!

Sincerely,

Marty Rutherford

Author's Preface

A narrow strip of sand, called a tombolo, connects two islands in this photograph from western Prince William Sound

I have always been fascinated with coastal areas. They are a magical area where the sea (or in some cases large freshwater lakes) meets land. That interest matured fully in 1995, during a seed collection project in an area near the Port Clarence LORAN Station in northwest Alaska. Traveling south from the station on a 4-wheeler, the peninsula narrowed to the point that both the left and right tires were in sea water. This was my first encounter with a tombolo, a depositional land form that is created when waves refract around an island to create a spit, tieing the island to the shore. Ahead of the tombolo, I could just make out additional above-water portions of the peninsula.

The lure of collecting additional seed to the south kept me inching ahead, even as the water was getting deeper and the sides of the tombolo were getting narrower. Looking around in a complete circle, I saw only water, and the 4-wheeler looked very small. I felt even smaller as I looked at a land vehicle in a watery world. As I put the machine in reverse and started to back out of the area, I saw the sand of the tombolo begin to slide laterally, and the front of the 4-wheeler begin to sink deeper. Fear took over. I'd never before realized just how fast a 4-wheeler could go in reverse, or how high those tires could throw water into the air! A charging bear could not have caused the adrenaline to flow through my body any faster.

What a truly fascinating place - that area where land meets water.

This guide is intended for use in coastal areas of Alaska, specifically the areas designated by the Alaska Inland Coastal Zone Boundaries. Coastal areas have been my primary focus with regard to revegetation and erosion control activities during the past 32 years. Consolidating and publishing the research and information gathered during that period motivated the development of this document.

The guide is divided into sections detailing steps that should be followed for a successful revegetation project. The guide is dedicated to the Great Land and its immense and fragile coastal region. It is my intent to raise awareness across the state of the need to protect and restore coastal environments as necessary in the land we call Alaska.

Researchers and environmental professionals from across Alaska were invited to share case studies for this publication, to showcase some outstanding revegetation and erosion control projects, as well as alternative approaches and ideas in restoration. These case studies demonstrate what can be accomplished or learned by recreating vegetation communities, landforms or controlling erosion using vegetation. The guide also provides an overview of work performed in Alaska's coastal regions by the Alaska Plant Materials Center (PMC) during the past three decades.

In the first section of this guide, the reader will find useful background information. A short history of the major impacts to the coast of Alaska is presented, along with an introduction to the principles of revegetation. A primer on coastline types and terminology, as defined by coastal geomorphologists is also included.

The **Project Implementation** section will guide the reader through the basics of the entire process of a revegetation project, from the initial project planning phase to obtaining necessary permits, seeding, and mulching. This section includes an introduction to soil science and planting methods, as well as other forms of planting stock used in Alaska. Information about seed quality and specifications is also presented. The Project Implementation section details various techniques used to prepare the planting surface, as well as other specialized planting methods. As many sites require additional protection to preserve important land features or critical habitats, conservation and protection methods are also covered.

Section 3, **Species Selection**, consists of a survey of available plant species appropriate for revegetation across Alaska. A description of vegetation communities in each region is included, along with lists of primary and secondary species adapted to that region. A table for each region will guide the reader in determining what species mixture will work best in the area. Each individual species is color-coded to the regions of Alaska to which is adapted, and this information is presented along with details of its growth habit and tolerances in the Plant Species chapter.

The **Case Studies** section consists of reports from past revegetation and restoration projects, provided by researchers and environmental professionals across the state. These projects, conducted in each region of Alaska, will expose readers to the realities of revegetation in the field; successes, challenges, and lessons learned. It is our hope that the case study section will become a useful resource for future projects. These reports, as well as case studies of future projects, are available on the web, at plants.alaska.gov/reveg/.

The final section of the manual lists the work cited, as well as a list of agencies and organizations that have an interest or statutory responsibility related to the coastal zone is also provided. We chose to include a reprint of the 1994 Beach Wildrye Planting Guide for Alaska as an appendix. This publication, though out of print, has continued to generate interest, warranting its inclusion. Also included as appendices are the amended State of Alaska seed regulations, and descriptions of other other publications of interest.

I hope you find this guide worthwhile and informative.

Stoney J. Wright

Acknowledgements

This guide was written to assist land owners, land managers, engineers and environmental professionals in making decisions regarding revegetation and the use of vegetation in soil erosion control and soil conservation. The information contained in the guide builds upon past revegetation manuals including:

Wright, Stoney J. (1994) - Beach Wildrye Planting Guide for Alaska. State of Alaska. Alaska Department of Natural Resources, Plant Materials Center. 28 pp.

Wright, Stoney J. and **Moore, Nancy J.** (1994) - Revegetation Manual for Eareckson Air Force Station Shemya, Alaska. State of Alaska, Division of Agriculture, Plant Materials Center. 34 pp.

Moore, Nancy J. and **Wright, Stoney J.** (1994) - Revegetation Manual for King Salmon Air Force Base, King Salmon, Alaska. State of Alaska, Division of Agriculture, Plant Materials Center. 51 pp.

2001 Alaska Highway Drainage Manual (2001) - Chapter 16: Erosion and Sediment Control. State of Alaska, Department of Transportation and Public Facilities.

Wright, Stoney J. (2008) - A Revegetation Manual for Alaska. Edited by Peggy Hunt. State of Alaska, Department of Natural Resources, Division of Agriculture, Plant Materials Center.

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Harvey Smith, **Ruth Carter**, **James Bowers** and **Janet Hall-Shempf** at the Alaska Department of Transportation, **Carrie Bohan** and **Marty Rutherford** with the Alaska Department of Natural Resources, and **John Whitney** at the National Oceanic and Atmospheric Administration.

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