

Backcountry ENVIRONMENTAL HEALTH MANUAL



COCONINO COUNTY DEPARTMENT OF HEALTH SERVICES ENVIRONMENTAL HEALTH

2002 First edition by Coconino Environmental Health.
For more information about this manual, contact:
Department of Health Services
Coconino County
2500 Fort Valley Road, Flagstaff, AZ 86001
E-mail: mgaither@co.coconino.az.us

ACKNOWLEDGEMENTS

We gratefully acknowledge the many backcountry operators who shared their time, wisdom, and facilities with us during the development of this manual.

Also we wish to express our sincere appreciation to the following people:

- Grand Canyon Park Service employees David Desrosiers, Brenton White, Mike McGinnis, Jim Nothnagel, Raymond Gunn, Joe Alston, and their many dedicated coworkers;
- Dr. Charles Gerba from the University of Arizona, and Craig Levy from the Arizona State Vector/Zoonotic Division;
- Dan Gaither, for the hours he spent editing this manual.
- ...and our special thanks go to every member of the Coconino County Environmental Health staff for their countless contributions throughout this long, challenging project.



TABLE OF CONTENTS

V	Introduction
1	Diseases
39	Water Purification
51	Food
73	Human Excreta & Solid Waste
78	Quiz Answer Key
82	References
83	Appendices
84	Home Study Exam and Course Evaluation Form



INTRODUCTION

Each year, millions of people visit America’s national forests, wilderness areas, parks, and public lands. They come from many different nations, cultures, and economic circumstances, but they share a common love of outdoor adventure. An entire industry has developed to supply these backcountry travelers with the tools, equipment, and products they use in their trips into the outback. Coincidentally, there has been a dramatic increase in the number of companies that provide guided trips on rivers, lakes, and trails throughout the country. Backcountry outfitters are in a unique business that combines the standard functions of the hospitality industry with the challenges posed by travel in difficult terrain.

Typically, backcountry outfitters assume the responsibilities of feeding and providing basic accommodations for their clients during wilderness outings. At minimum, this involves safely storing, transporting, and preparing food, providing toilet and sanitary facilities, and taking reasonable precautions against disease and injury. Although the specific nature and complexity of the



services that different outfitters provide may vary greatly, it is possible to generalize about the things they need to know and do to fulfill their obligations to their clients.

Simply stated, backcountry operators are required to take reasonable steps to ensure that their clients are as healthy at the end of each trip as they were when the trip began. This entails learning about the diseases to which travelers may become exposed, and techniques for minimizing the risk of illness. In addition, operators must learn how to store and prepare food safely in a primitive setting, how to purify water, and how to handle and dispose of solid waste and human excreta. The responsibilities of a backcountry operator are many, and may at times seem overwhelming. Fortunately, most of the health risks posed by wilderness travel may be easily overcome by following the simple procedures described in this manual.

While much of the information presented in this manual is focused on risks to human health, the techniques described are equally effective in protecting the health of natural ecosystems. Wild areas are especially vulnerable to contamination and damage from human presence, and when people become ill in the wilderness it often is a result of previous human visitation. Operators who learn and implement the practices recommended in this manual will be doing a great service, both to their clients and to the wild places they visit.

DISCLAIMER

This manual is designed to provide the best available demonstrated technology for water purification, food safety, human excreta and solid waste handling and disposal under field conditions. The information provided in this manual is based on the latest federal codes and guidelines. This manual does not attempt any interpretation of state or local laws concerning water treatment, food safety, human excreta and solid waste handling. Backcountry operators who are uncertain about the impact of local or state laws are urged to consult their local or state agencies.