

TOWARD BETTER ENVIRONMENTAL DECISION-MAKING

Committee on Assessing and Valuing the Services of Aquatic and Related Terrestrial Ecosystems

Water Science and Technology Board

Division on Earth and Life Studies

NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES

THE NATIONAL ACADEMIES PRESS Washington, D.C. www.nap.edu

Contents

EXE	CUTIVE SUMMARY	. 1
1	INTRODUCTION Statement of the Problem Study Origin and Scope Perspective of the Report Summary and Conclusions References	22 26 27 29
2	THE MEANING OF VALUE AND USE OF ECONOMIC VALUATION IN THE ENVIRONMENTAL POLICY DECISION-MAKING PROCESS Introduction Role of Economic Valuation The Economic Approach to Valuation Summary: Conclusions and Recommendations References	33 35 44 54
3	AQUATIC AND RELATED TERRESTRIAL ECOSYSTEMS Introduction Extent and Status of Aquatic and Related Terrestrial Ecosystems in th United States Cataloging Ecosystem Structure and Function and Mapping Ecosyste Goods and Services Issues Affecting Identification of Goods and Services Summary: Conclusions and Recommendations References	59 59 62 m 75 83 88
4	METHODS OF NONMARKET VALUATION Introduction Economic Approach to Valuation Classification of Valuation Approaches	95 95 00 29 37 41
5	TRANSLATING ECOSYSTEM FUNCTIONS TO THE VALUE OF ECOSYSTEM SERVICES: CASE STUDIES	

s farst so the substitution of the second state of the second second second second second second second second

xi

.

	Introduction Mapping Ecosystem Functions to the Value of Ecosystem Services	
	Case Studies	
	Implications and Lessons Learned	
	Summary: Conclusions and Recommendations	
	References	
6	JUDGMENT, UNCERTAINTY, AND VALUATION	. 209
	Introduction	
	Professional Judgments	
	Uncertainty	. 216
	Decision-Making and Decision Criteria Under Uncertainty	. 221
	Illustrations of the Treatment of Uncertainty	. 227
	Summary: Conclusions and Recommendations	
	References	
7	ECOSYSTEM VALUATION:	
	SYNTHESIS AND FUTURE DIRECTIONS	. 239
	General Premises	. 240
	Synthesis of Major Conclusions	. 242
	Guidelines/Checklist for Valuation of Ecosystem Services	
	Overarching Recommendations	

APPENDIXES

Summary of Related NRC Reports	261
Production Function Models	
Committee and Staff Biographical Information	274