

Evaluating Criteria Guiding Transition of
Science Activities to Management Actions
in Adaptive Management Programs

GCDAMP
Science Advisors

Technical Work Group Meeting
Phoenix, AZ
January 19-21, 2010

Project Objectives

- Evaluate adaptive management literature for guidance on criteria to transition from science to management actions
- Survey active adaptive management programs for criteria being utilized

Adaptive Management Conservation Projects

- Adaptive water fowl harvest management; Fred Johnson
- Kissimmee River Program; Kent Loftin
- Columbia River Programs; David Marmorek
- Cal-Fed Program; Michael Henley
- Bridge River Restoration Program; Lee Failing
- Trinity River Restoration Program; Mike Hamman
- Klamath Basin Restoration Programs; Randy Brown/Phil Dietrich
- Platte River Program; Chad Smith

Adaptive Management Conservation Projects (con't)

- San Juan River Recovery Implementation Program
- Northwest Forest Plan; Oregon, Wash
- Jornada Experimental Range; NM
- East Cascades Greater Forest Ecosystem
- South Florida Restoration Task Force
- Upper Colorado River Recovery Implementation Program
- Chesapeake Bay Program
- Lower Colorado Multispecies Conservation Plan

Proposed Activities

- ▶ Nov. 2009 obtain input from GCMRC and TWG on project prospectus
- ▶ January 2010, report progress at TWG meeting
- ▶ February 2010, report progress at AMWG meeting
- ▶ February 2010, submit final report to TWG/AMWG/GCMRC

Literature Review



- AM is relatively new approach in management science
 - Development of approaches in 1970s to 1990s
 - Applications ; 1980s to current
- Utilizes concepts from several science areas
 - Management science
 - Probability theory
 - Risk and uncertainty
 - Decision theory
 - Conservation biology
 - Ecosystem science

Literature Review (con't)



- **Impetus for AM Development**
 - **Need to address natural resource management under significant uncertainty**
 - **Need to incorporate broad stakeholder group input**
 - **Need to conduct policy experiments with management actions**

Literature Review (con't)



- **Principals of AM Application**
 - AM approach must be understood, transparent and open with stakeholders engaged
 - AM goals, objectives, dfcs, processes etc. must be understood and embraced
 - Management alternatives, management actions and assumed impacts must be documented
 - Management decisions and iterative assessment and management action cycles should respond to system behavior
 - Critical tools of decision theory under uncertainty need to be employed
 - Assessment of AM effectiveness and improved approaches need to be adopted

Literature Review (con't)



- **Adjusting management actions based on learning improves resources, decisions and knowledge**
- **Monitoring /science evaluates management effectiveness to attain objectives**
- **AM programs must adopt revised AM approaches to remain effective**

AM Theory and Practice Does Not Identify Expressed Need to Establish Criteria to Move From Science Activity to Management Action

- AM accepts the reality that we cannot resolve uncertainty in many natural resource programs
- AM is a management model adapted to issues of continued high uncertainty where traditional science paradigms have limited effectiveness
 - Complex multi-objective large scale natural resource issues with high variability and uncertainty
- Smaller scale experiments to establish proofs for pilot tests have limited system effectiveness
- AM approach is “learning by doing” i.e. implement management actions; monitor results; revise management actions
- AM must make greater use of risk analysis, probability theory, Bayesian statistics, tradeoff analysis, etc. to accommodate uncertainty in decisions



GCDAMP Issue of Science Transition May Relate to GCDAMP Design, Objectives and Operating Protocols

- Design of GCDAMP post EIS emphasized aggressive science program to develop baseline information, LTEP basis, etc
- GCDAMP program structure, strategic science plan, budget, etc. reinforced science focus
- Implementation of first decade GCDAMP focused strongly on learning
- Greater emphasis toward management actions in 2004-2009 period

2004–2009 Changing Emphasis in GCDAMP Relating to Management Actions

- ▶ Increasing Management Actions
 - Translocation LCR; translocation other tributaries; HFEs; LSFs; Non–native fish control mainstem; non–native fish control tributaries; cultural value impact mitigation;
- ▶ Increasing Compliance:
 - Native American properties/cultural resources; non–native fish control; native fish translocation; HFE; LSF; AM protocols; native fish population assessments; KAS protection; recovery program
- ▶ Increasing Science:
 - Physical resource program, cultural resource program; native fish program; food base program; non–native fish program; riparian ecology program; modeling program; data management program; socio–economic program; etc

NEED FOR ASSESSMENT OF GCDAMP PROTOCOLS AND PROCEDURES RELATING TO DEVELOPING AND IMPLEMENTING MANAGEMENT ACTIONS

- Review and Proposals
 - ❖ 2005 SA Review
 - ❖ Roles Report
 - ❖ GCMRC Strategic and Annual Plan
 - ❖ TWG Recommendations
 - ❖ SPG Report
- Recommendations
 - ❖ GCDAMP direct TWG to form management group to develop programmatic directions for developing management actions

POTENTIAL AMWG CONSIDERATIONS TO ADDRESS MANAGEMENT ACTIONS

- ❖ Clarify Management Needs
 - Goals, DFCs, Objectives
 - Management Information Needs
 - Strategic Management Questions
- ❖ Review and Revise AM Structure and Procedures
 - Roles and Responsibilities
 - Protocols and Procedures
- ❖ Review and Revise AM Model
 - Risk Averse Model
 - Science/Management Actions
 - Risk Acceptance Model
 - Management Actions/Monitoring
- ❖ Incorporate Greater Uncertainty Analysis
 - Risk Analysis
 - Probability Assessments
 - Bayesian Statistics
 - Decision Theory
 - Tradeoff Analysis

