

Environmental Baseline

Edwards Aquifer Recovery Implementation Program

18 May 2010

Adam Zerrenner
U.S. Fish and Wildlife Service



What is the Environmental Baseline?

The environmental baseline includes the **past and present impacts of all** Federal, State, or private actions and other **human activities** in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process.

[50 CFR §402.02]

Baseline includes...

The environmental baseline includes factors such as:

Status of the species

Status of delineated Critical Habitat

Factors contributing to the current status





Baseline therefore may incorporate:

Species abundance and productivity

Current and historic range

Distribution (including occupied and unoccupied habitat)

Population trends and age class distributions

Connectivity between populations

Current habitat quality and quantity

Historic weather patterns and hydrographs

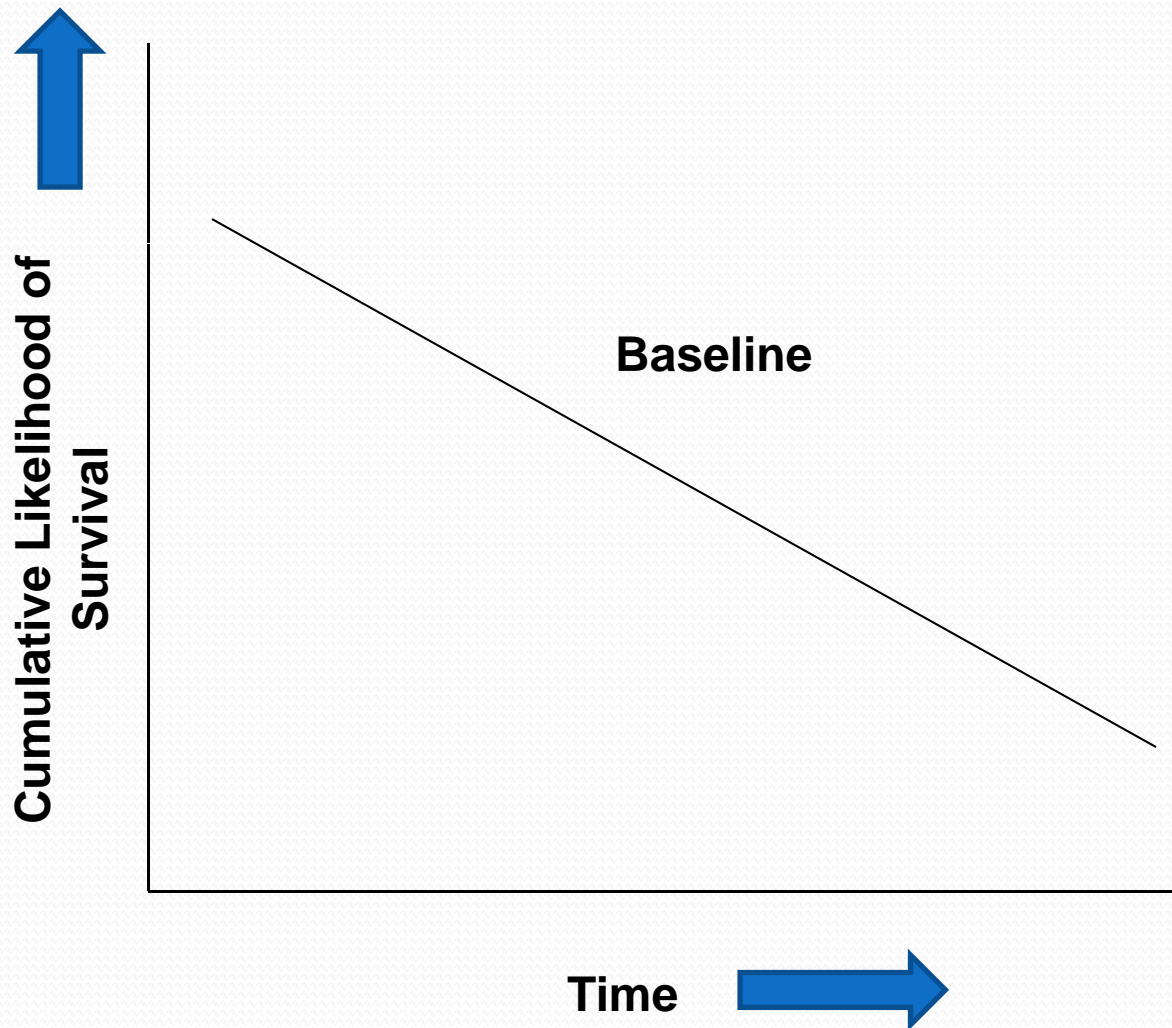
Historic human uses with species impacts (pumping, recreation, etc.)

Specific events causing significant impacts (contaminant spills, construction of a feature that altered habitat, etc.)

Non-point factors (runoff, increased nutrients, etc.)

Any and all factors describing the current state of the species and its habitat and how and why the species arrived at this status

Environmental Baseline





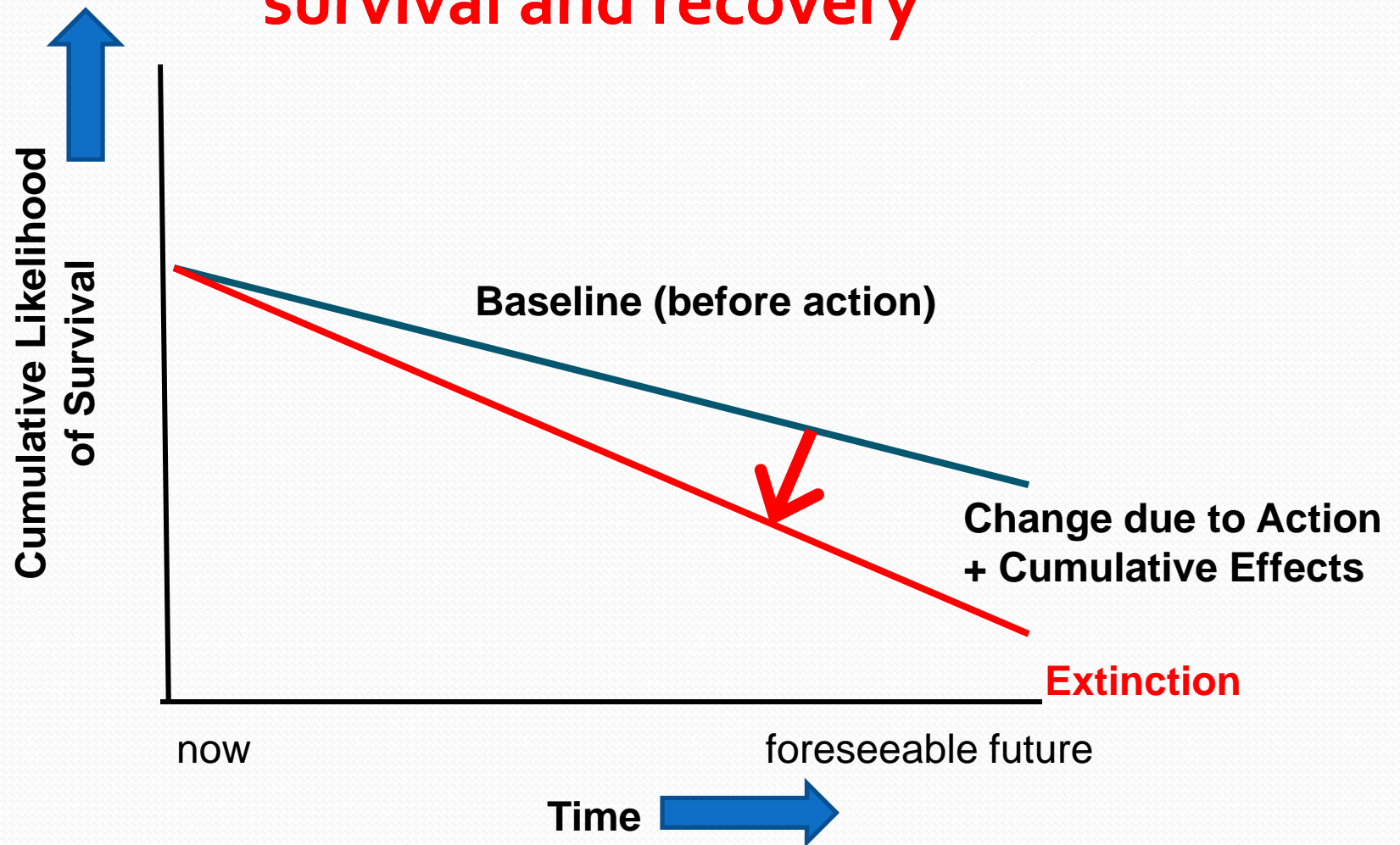
What is Jeopardy?

To “Jeopardize the continued existence”
is to engage in an action that reasonably would be
expected, directly or indirectly, to **reduce** appreciably
the **likelihood of both the survival and recovery** of a
listed species **in the wild** by reducing the
reproduction, numbers or distribution of that species.

[50 CFR §402.02]

Jeopardy

“Appreciable reduction in the likelihood of survival and recovery”



Two Examples

Texas wild-rice
(*Zizania texana*)



Comal Springs dryopid beetle
(*Stygoparnus comalensis*)



Warning:

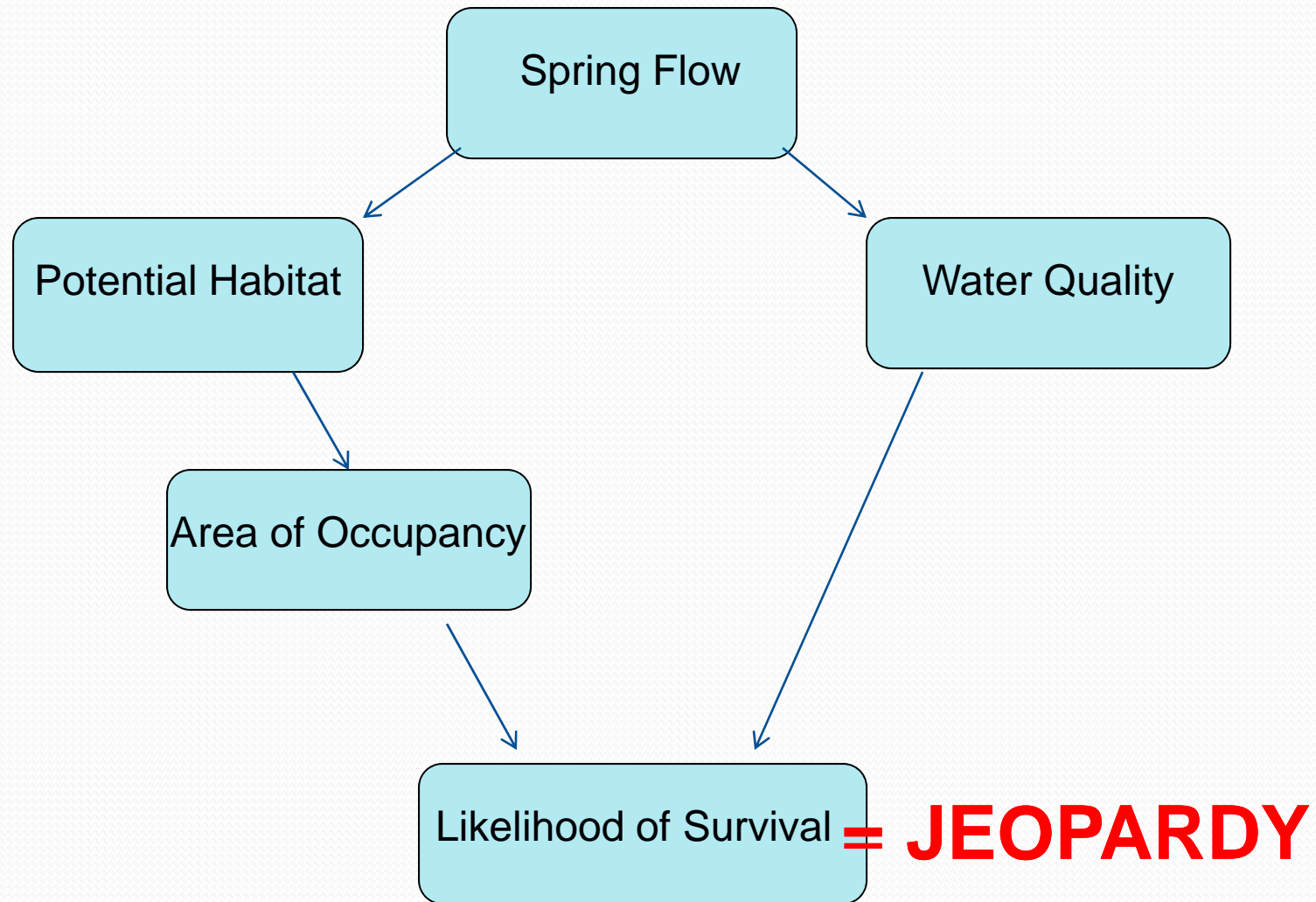
First a quick disclaimer:

These are only examples!

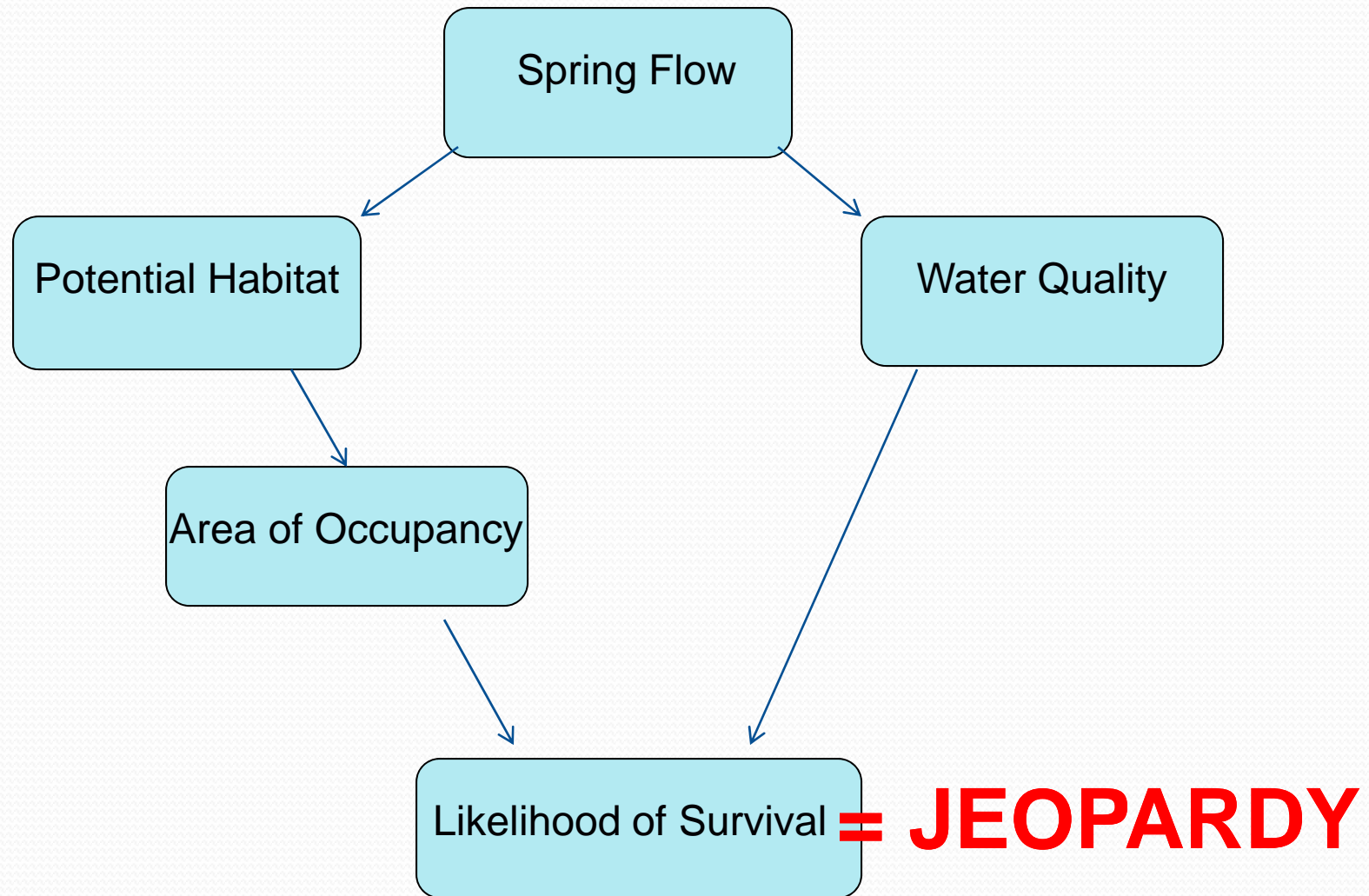
These examples have been selected to illustrate concepts, and do not represent any actual determinations by the Service...

The information that will be needed to perform the required analysis has not yet been collected or analyzed, as this can only proceed once the Stakeholders agree upon an action or a suite of actions.

Conceptual Texas Wild-Rice Influence Diagram



Conceptual Texas Wild-Rice Influence Diagram



Conceptual Influence Diagrams for the Comal Springs Riffle Beetle

The example Influence Diagrams provided here for the Comal Springs Riffle Beetle were developed by Jean Cochrane of the USGS Patuxent Wildlife Research Center and Randy Gibson at the USFWS San Marcos National Fish Hatchery and Technology Center.

This model was created to help assess how different management strategies may affect future populations of the Comal Springs Riffle Beetle.

This model represents a preliminary or “alpha” iteration and will continue to change by incorporating impacts, relationships and effects to the species and their habitat.

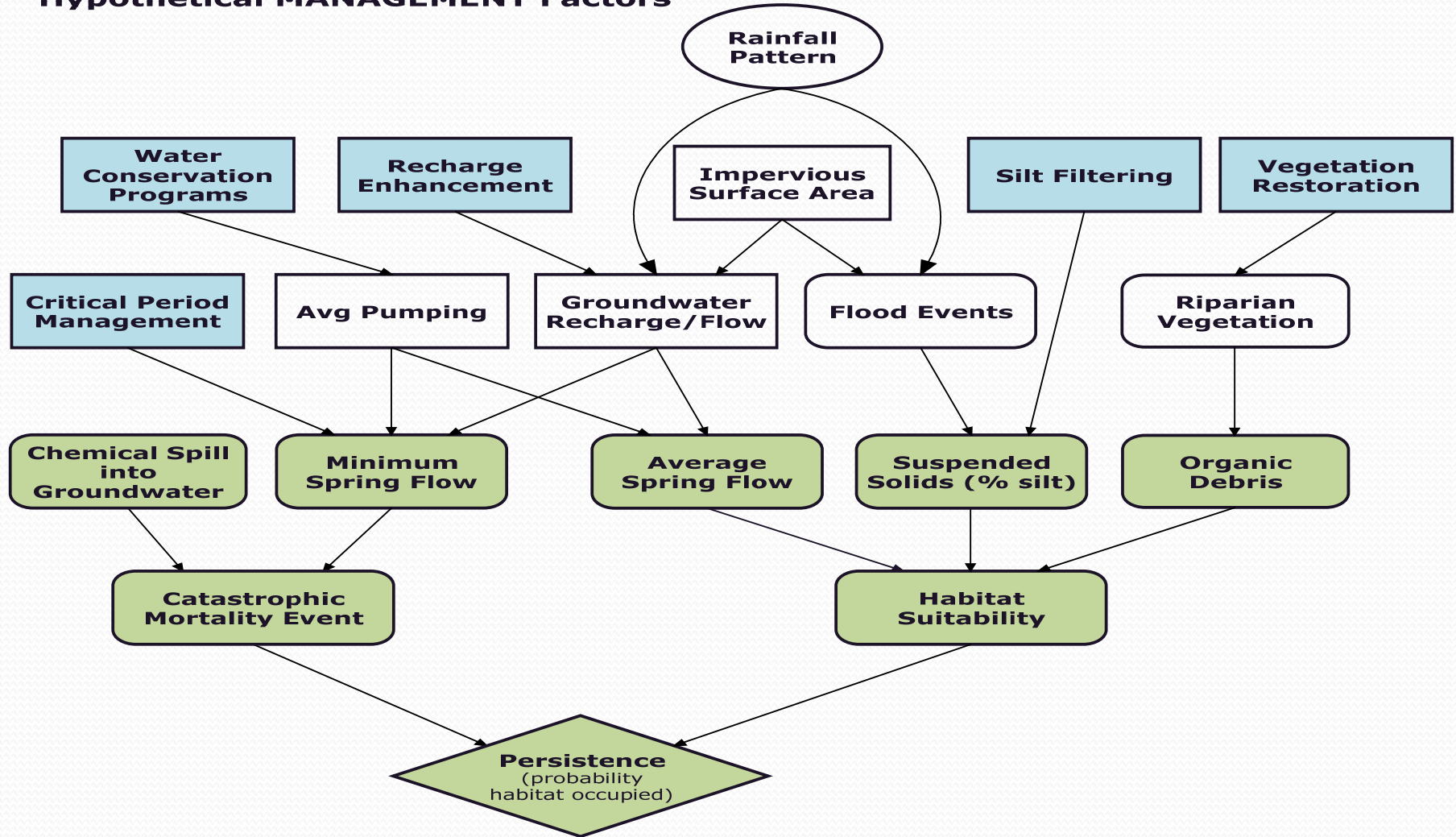
A paper describing the development and potential applications of this approach is currently in review, and will likely be published as:

Cochrane, J. F. and R. Gibson, 2010. Prototype Belief Net Model for the Comal Springs Riffle Beetle: Illustration of a tool to aid Recovery Implementation Planning for the Edwards Aquifer, Texas

Conceptual Influence Diagram

COMAL SPRINGS RIFFLE BEETLE
Population Persistence Influence Diagram

~
Hypothetical MANAGEMENT Factors





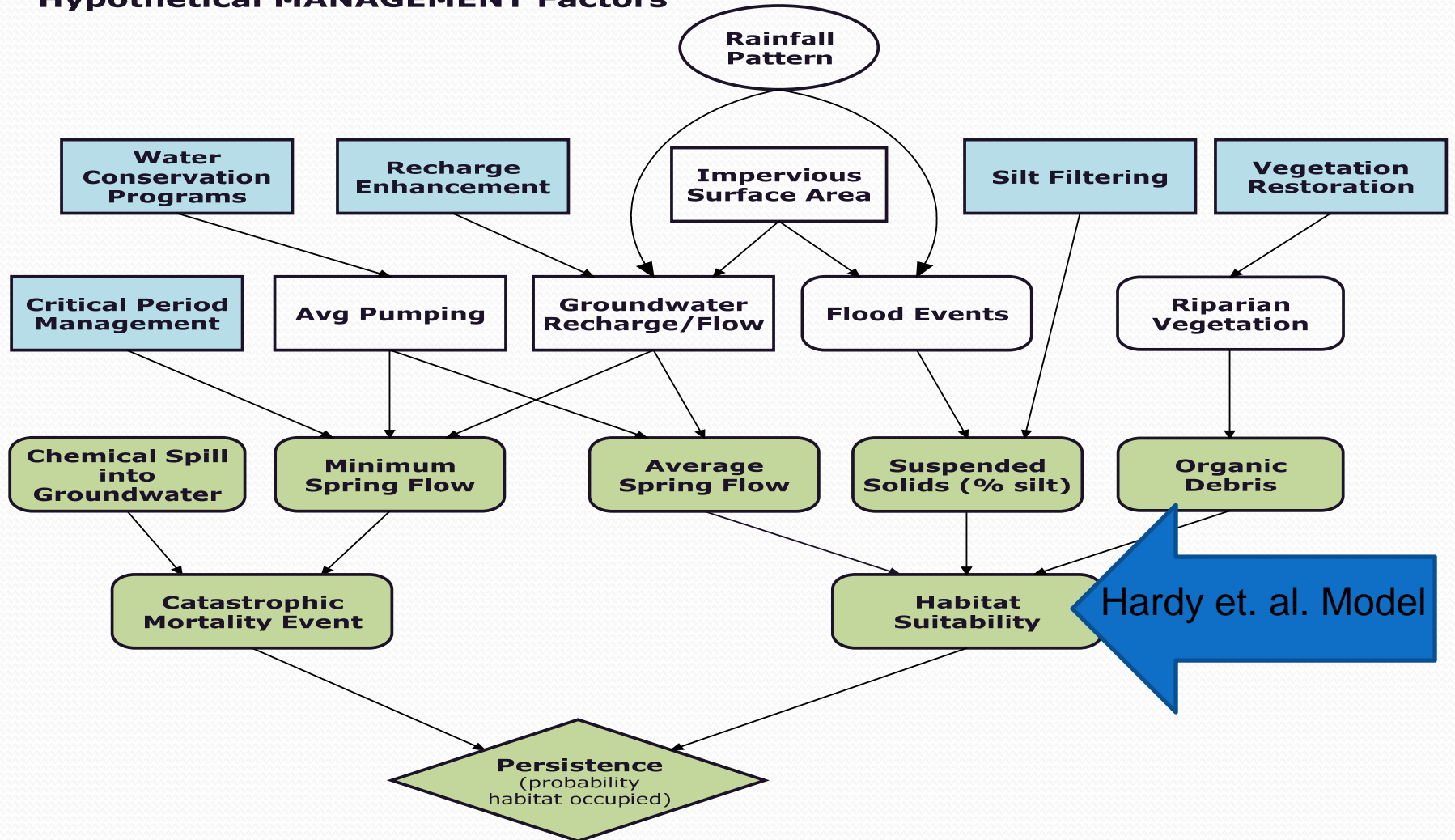
Note that “cells” representing influences may consist of models...

For example, in the Comal Springs Riffle Beetle example, the “Habitat Suitability” cell may represent the Hardy et. al. model.

Conceptual Influence Diagram

COMAL SPRINGS RIFFLE BEETLE
Population Persistence Influence Diagram

~
Hypothetical MANAGEMENT Factors



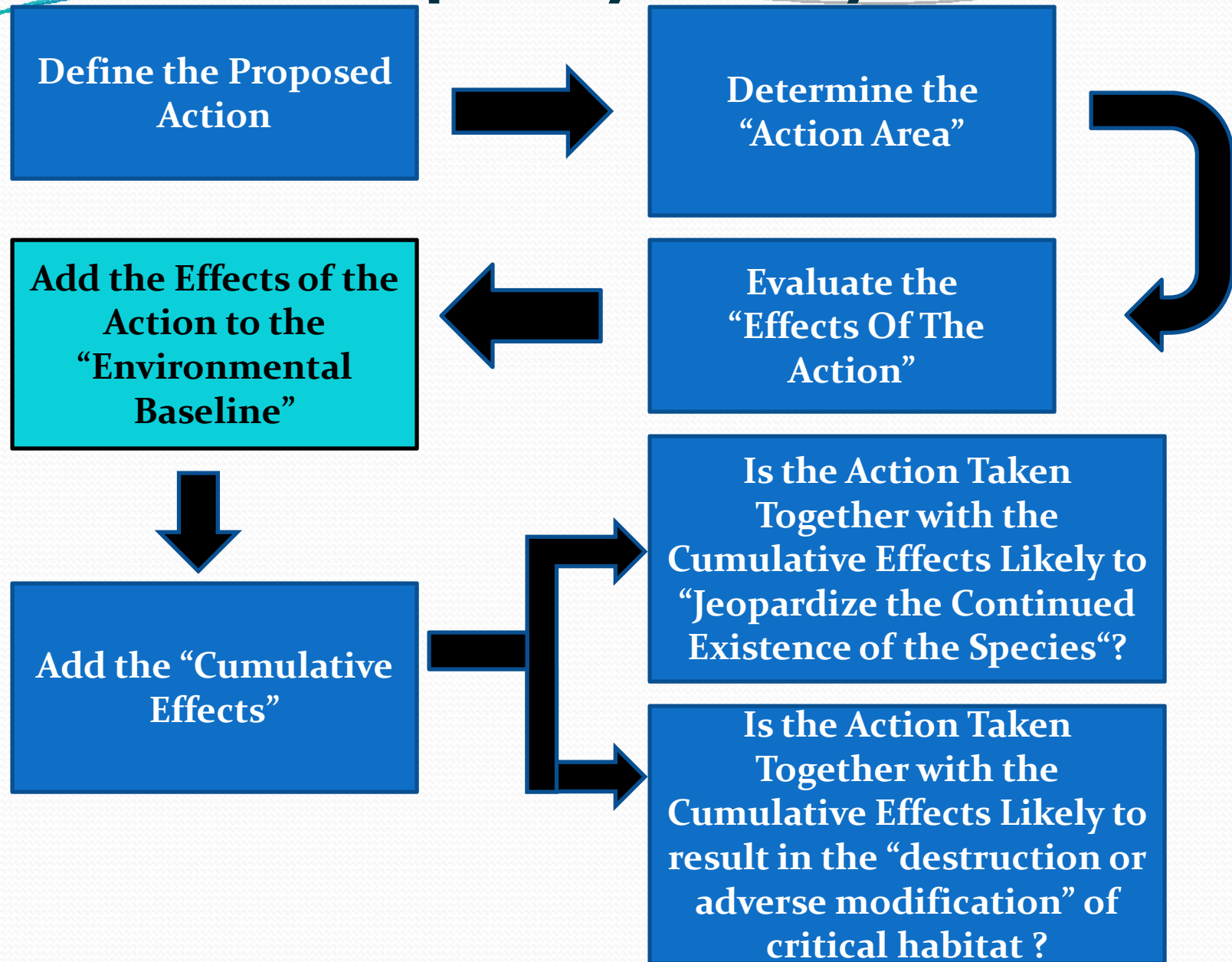


What is the Environmental Baseline?

“The environmental baseline is an analysis of past and ongoing human and natural factors leading to the current status of the species, its habitat (including designated critical habitat), and ecosystem, within the action area. The environmental baseline is a “snapshot” of a species’ health at a specified point in time.”

-USFWS and NMFS Consultation Handbook, March 1998

Jeopardy Analysis



What is “Recovery”?

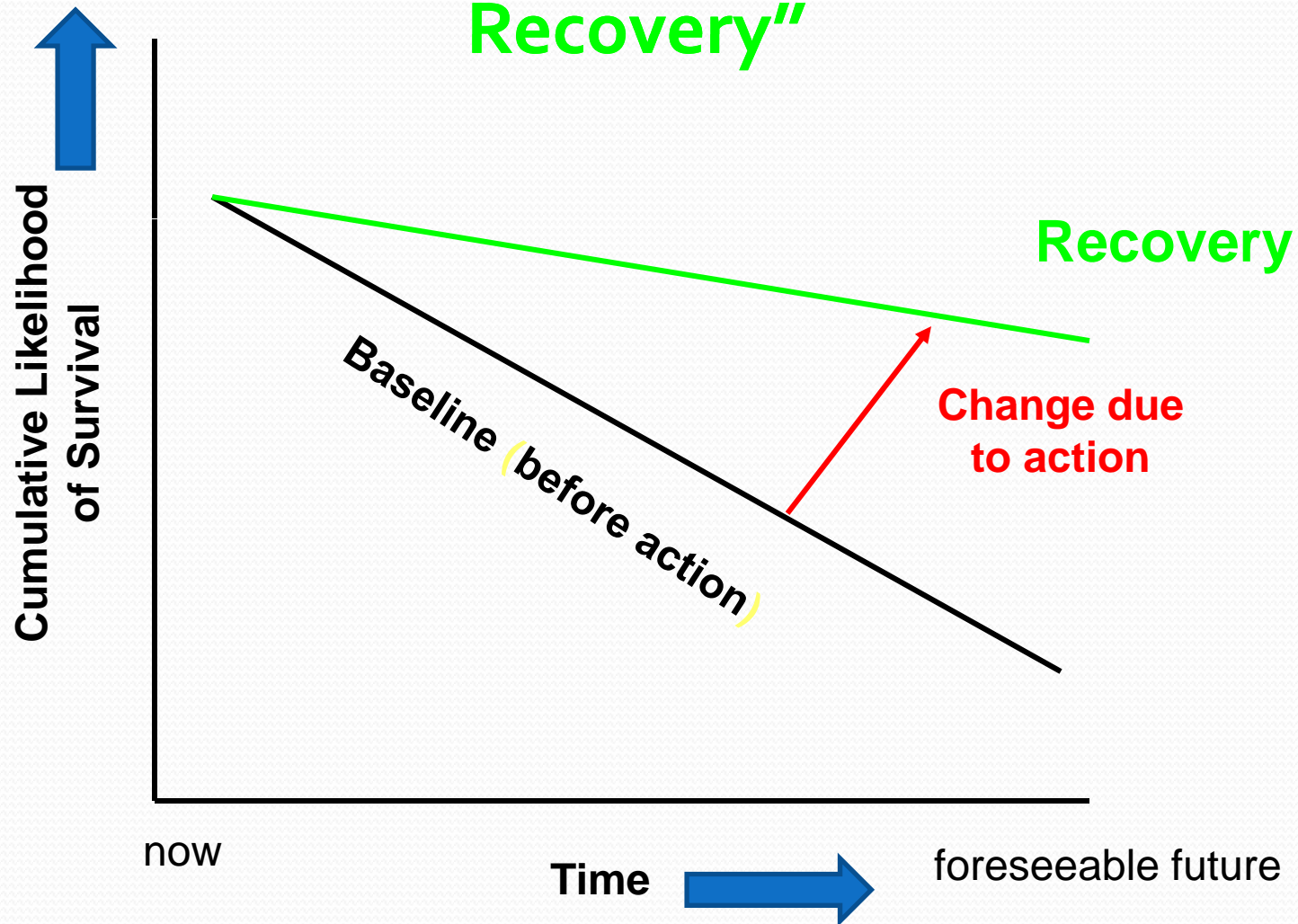
Recovery is the point at which a species no longer warrants listing under the ESA

This means the species is no longer “likely to become in danger of extinction in all or a significant portion of its range in the foreseeable future.” (e.g, no longer a threatened or endangered species)

Recovery, therefore, is when the likelihood (or probability) of extinction over some future (time) is low enough again to no longer be a danger

Contribution to Recovery

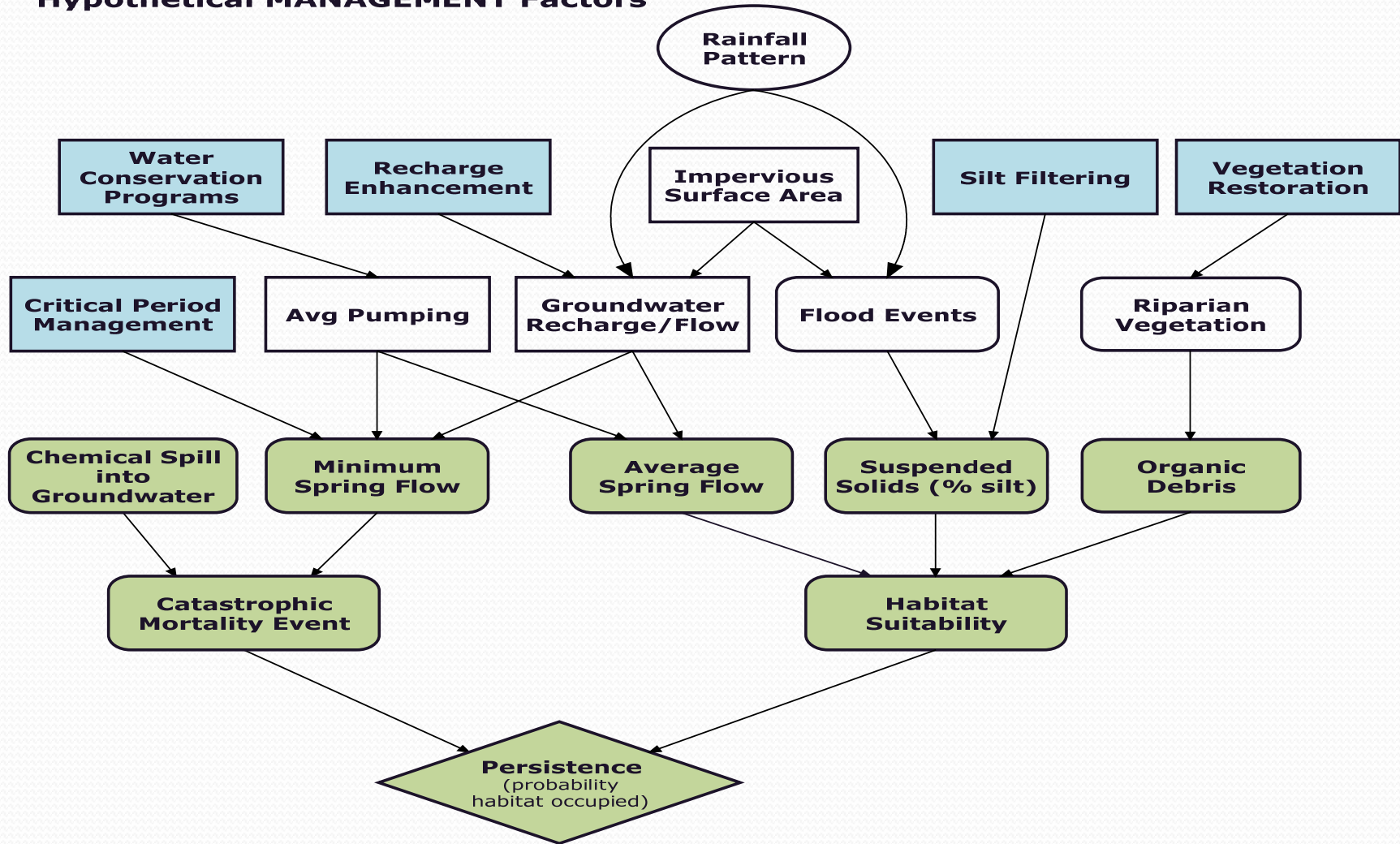
“Increased Likelihood of Survival and Recovery”



Conceptual Influence Diagram

COMAL SPRINGS RIFFLE BEETLE
Population Persistence Influence Diagram

~
Hypothetical MANAGEMENT Factors





Adam Zerrenner
U.S. Fish and Wildlife Service
Austin Ecological Service Field Office
512-490-0057