Edwards Aquifer Recovery Implementation Program

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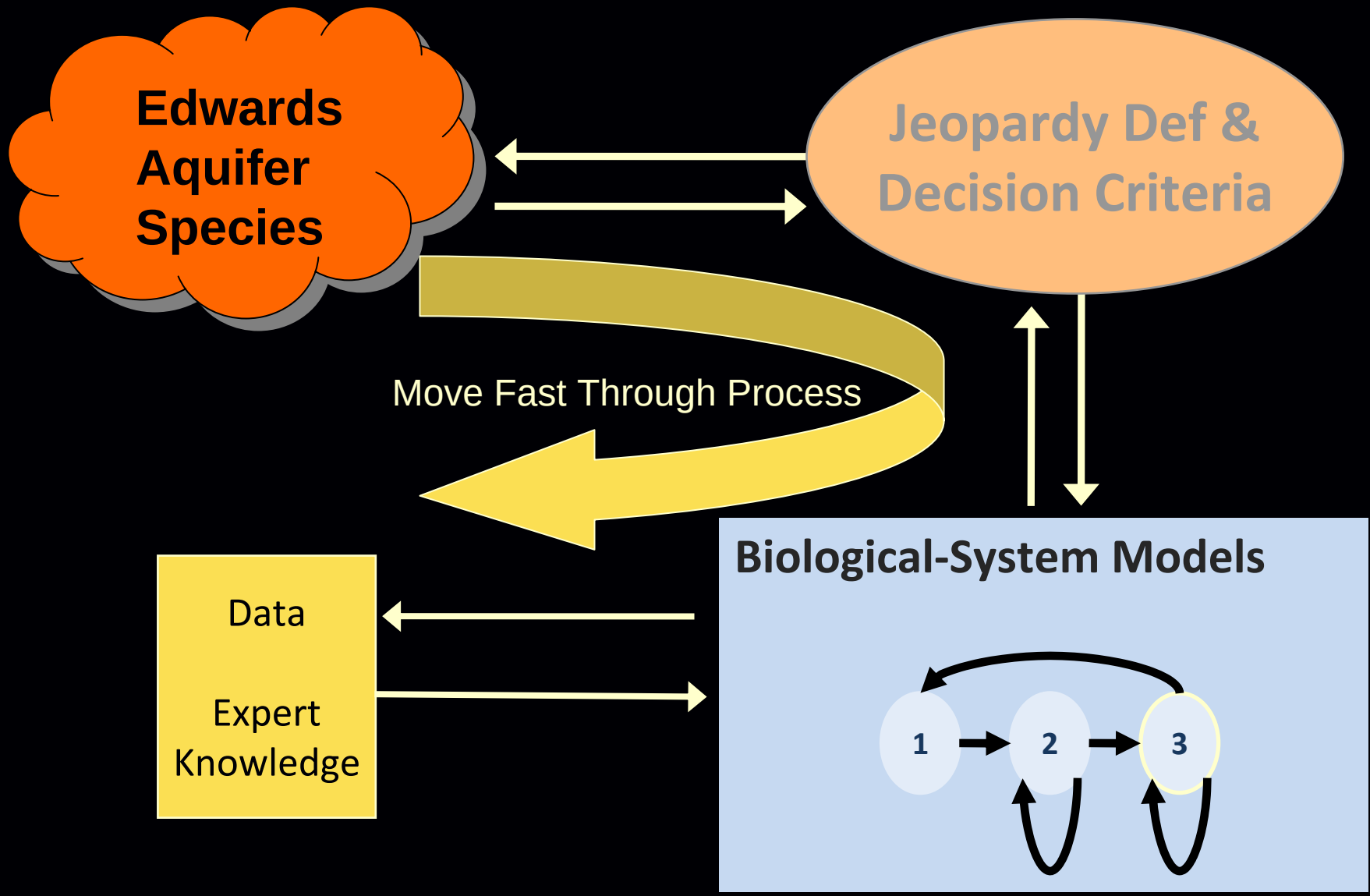
What is Structured Decision Making?

- Carefully organized and transparent process for making decisions based on explicit:
  - Questions (decision problems)
  - Analysis
  - Decision criteria

Structured Decision Making

- Is a formal method for analyzing a decision by breaking it into components
- Helps identify where the impediments to a decision are, to focus effort on the right place
- Provides a wide array of analytical tools for dealing with particular impediments

Jeopardy Rapid Prototyping



What is Jeopardy?

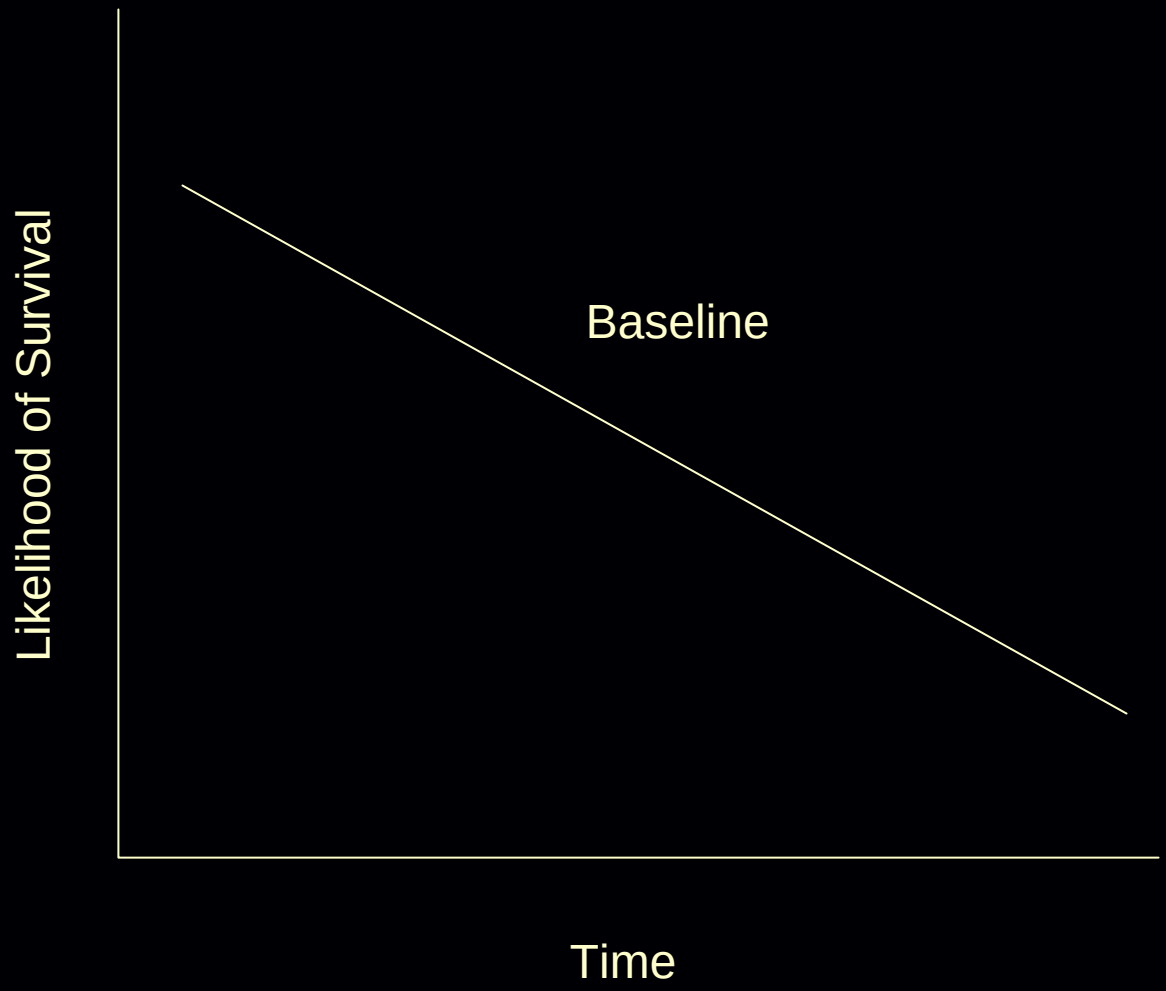
"Jeopardize the continued existence of"

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]

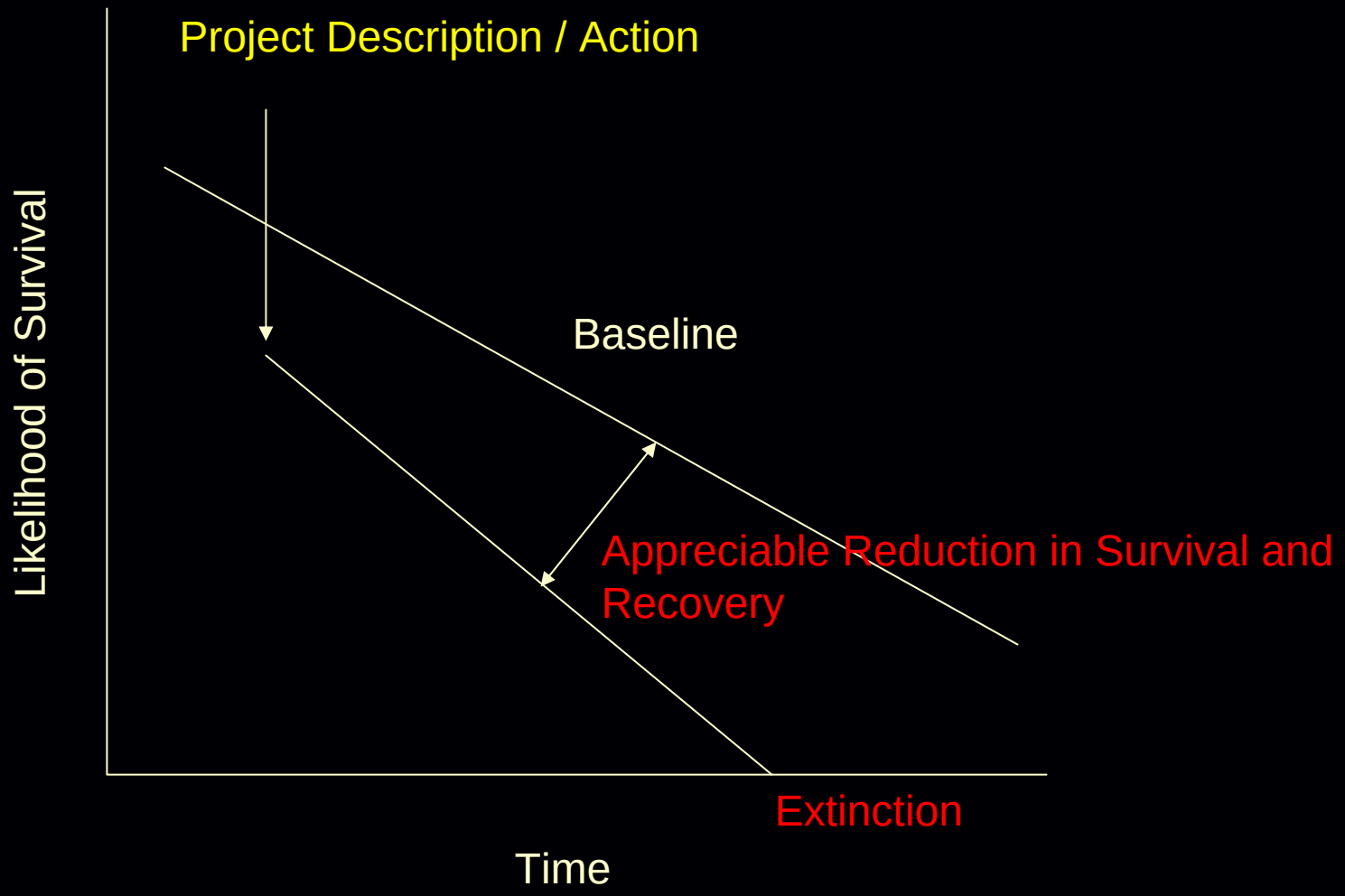
What is the Baseline?

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 of Species



Jeopardy

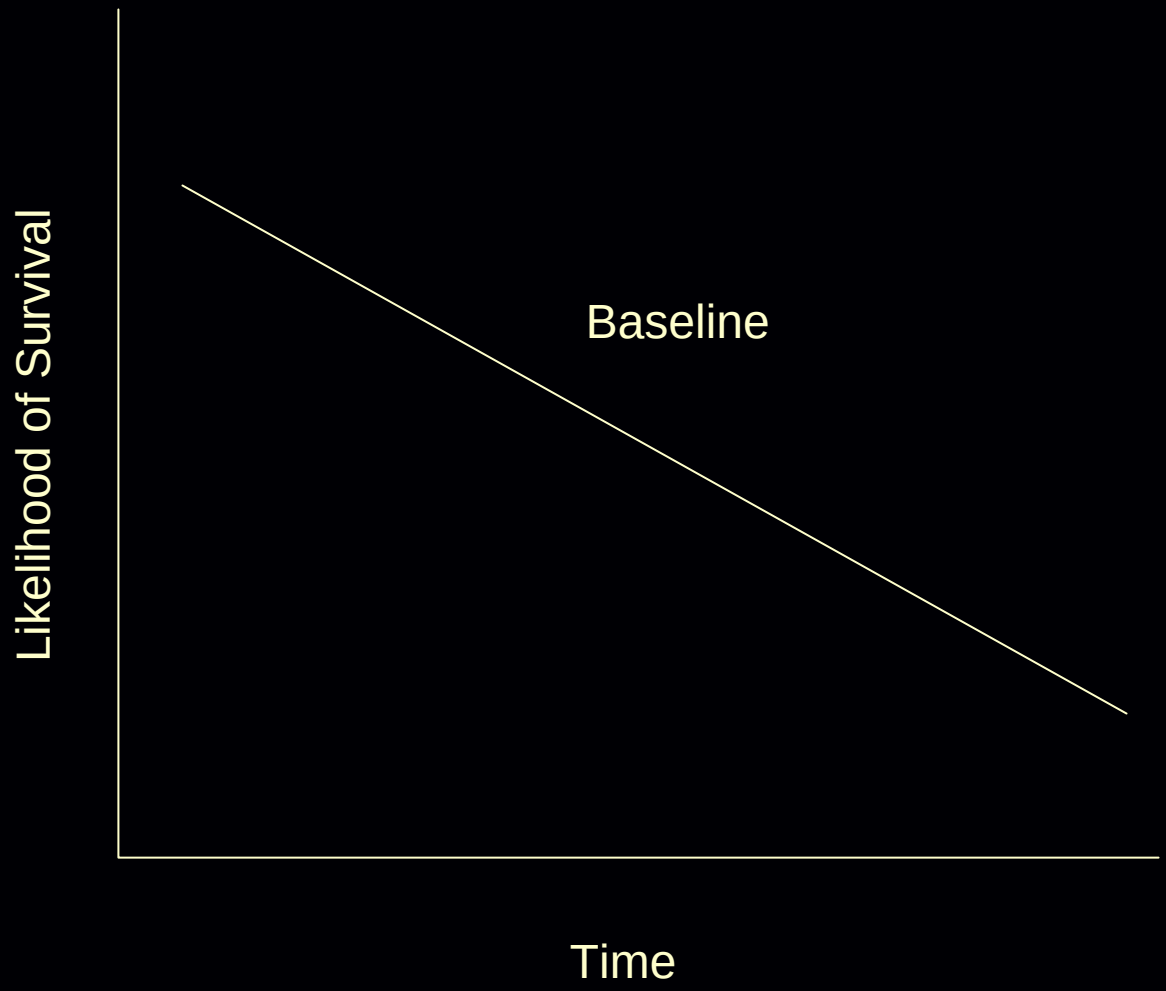

Project Description / Action
Likelihood of Survival
Baseline
Appreciable Reduction in Survival and Recovery
Extinction
Time

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

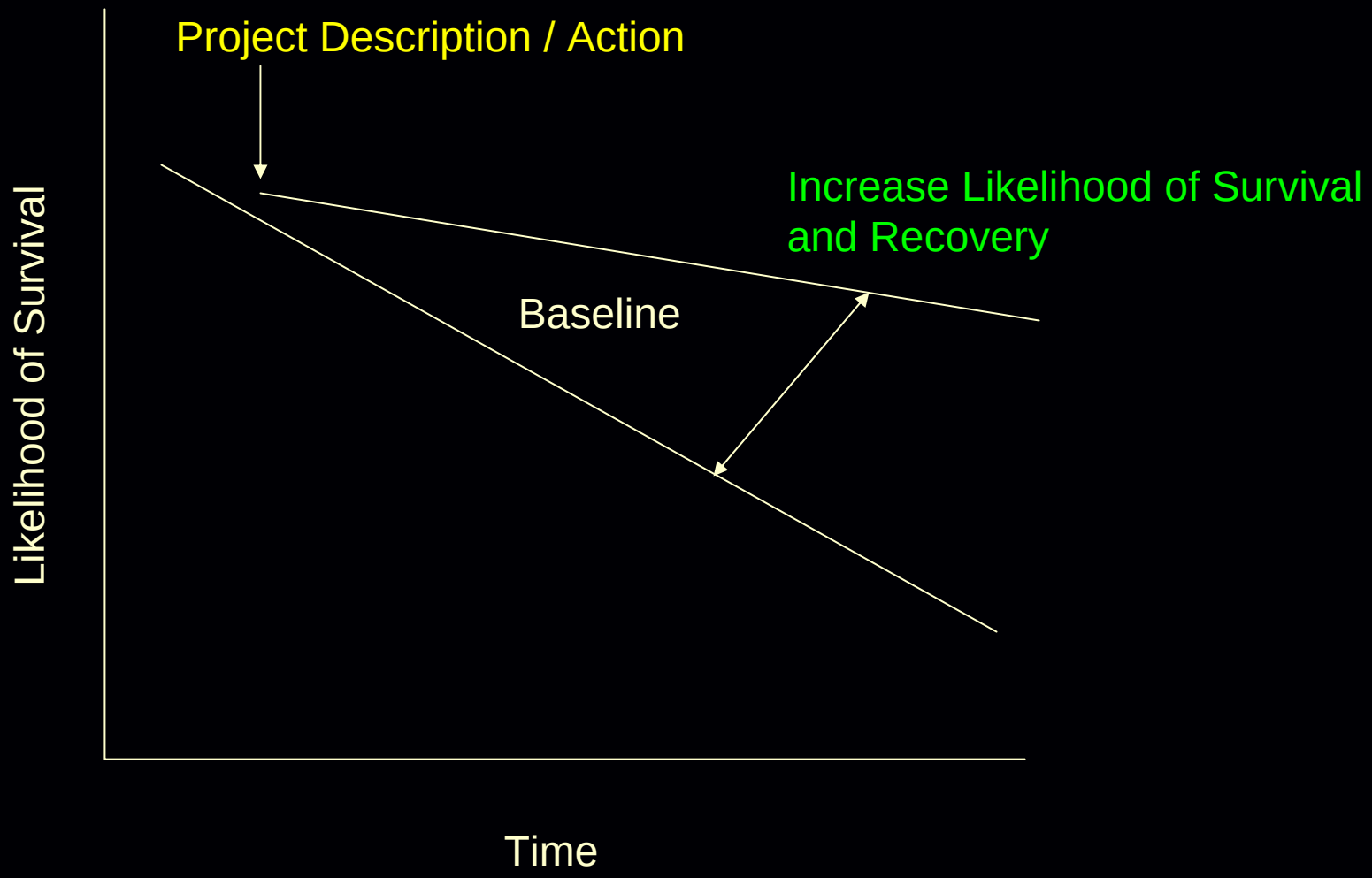
This means, the species is no longer “likely to become in danger of extinction in all or a significant portion of its range in the foreseeable future.” (e.g, no longer a threatened or endangered species)

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

Baseline of Species



Contribution to Recovery



EDWARDS AQUIFER MINIMUM SPRINGFLOW FOR MAINTAINING LISTED SPECIES AT COMAL AND SAN MARCOS SPRINGS

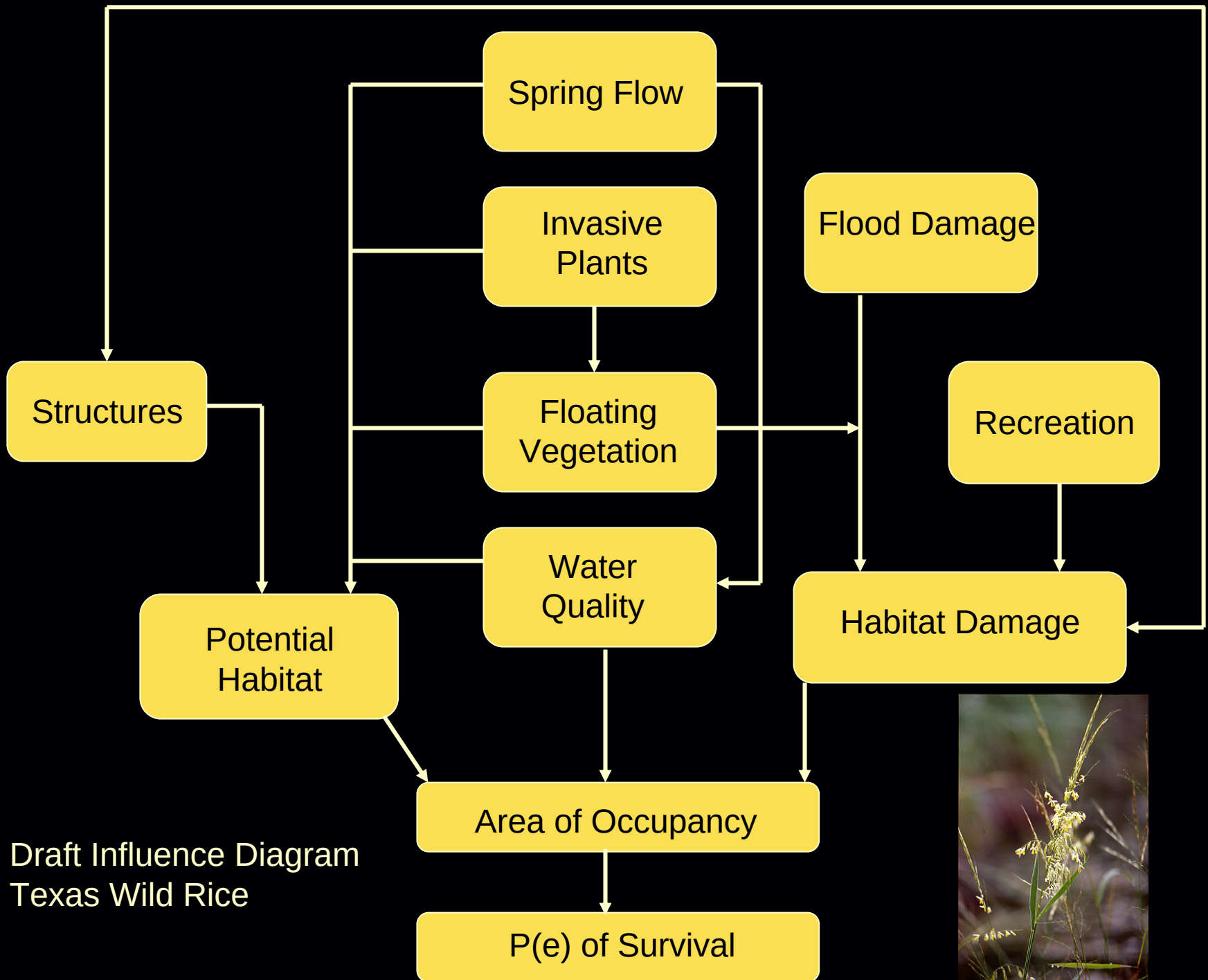
(Minimum springflow determined by USFWS)

SPECIES	MINIMUM FLOW (cubic feet/second)
"TAKE" LIMITS	
Comal Springs	
Fountain Darter (without snail control) (with snail control)	 200 150
San Marcos Springs	
Fountain Darter	100
San Marcos Gambusia	100
San Marcos Salamander	60
Texas Blind Salamander	50
"JEOPARDY" LIMITS	
Comal Springs	
Fountain Darter (without snail control) (with snail control)	 150 60
San Marcos Springs	
Fountain Darter	100
San Marcos Gambusia	100
Wild Rice	100
San Marcos Salamander	60
Texas Blind Salamander	50

Species

Texas wild-rice (*Zizania texana*)

Comal Springs dryopid beetle (*Stygoparnus comalensis*)

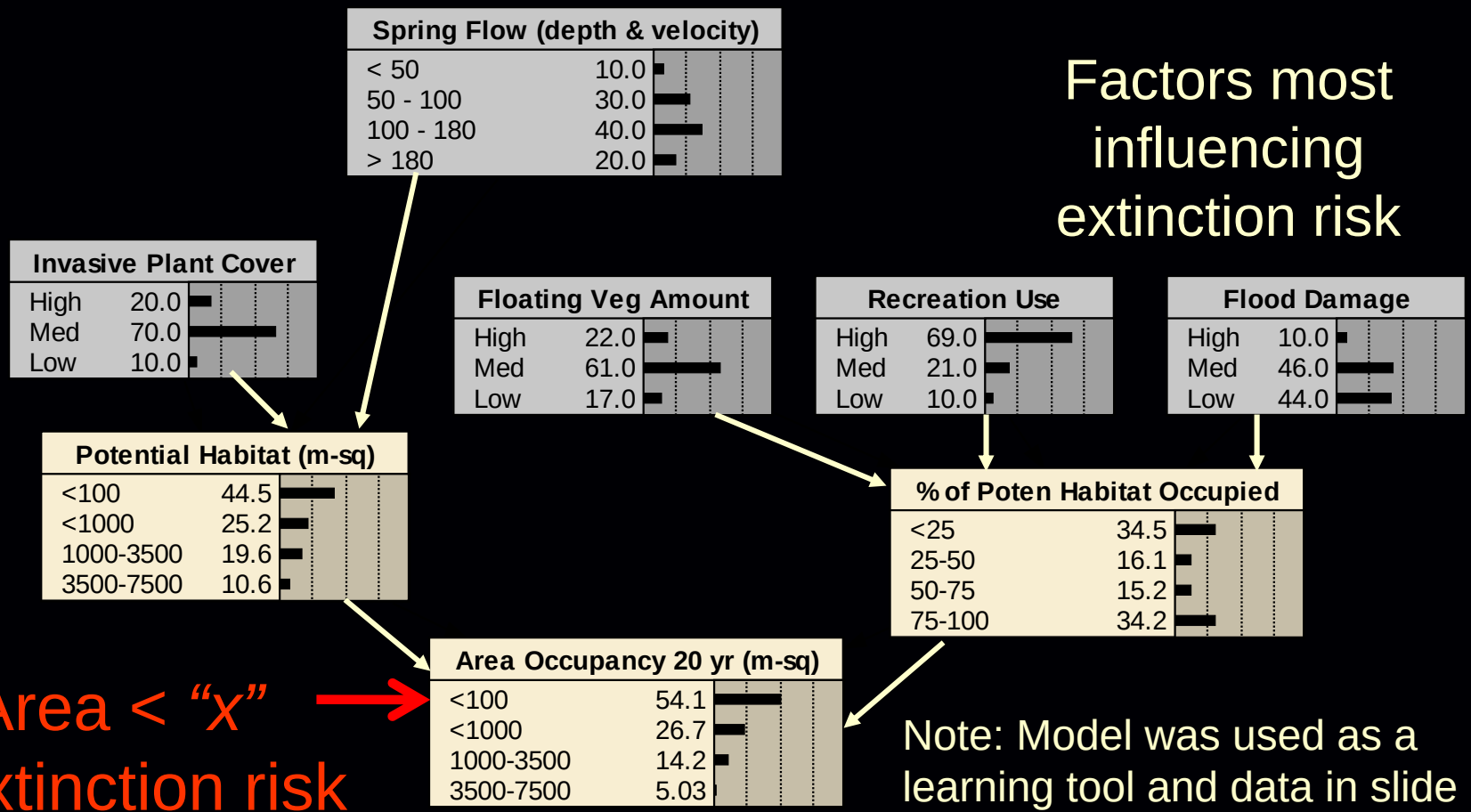


Draft Influence Diagram
Texas Wild Rice

Hypothetical Belief Net Model

Texas Wild-rice

Factors most influencing extinction risk



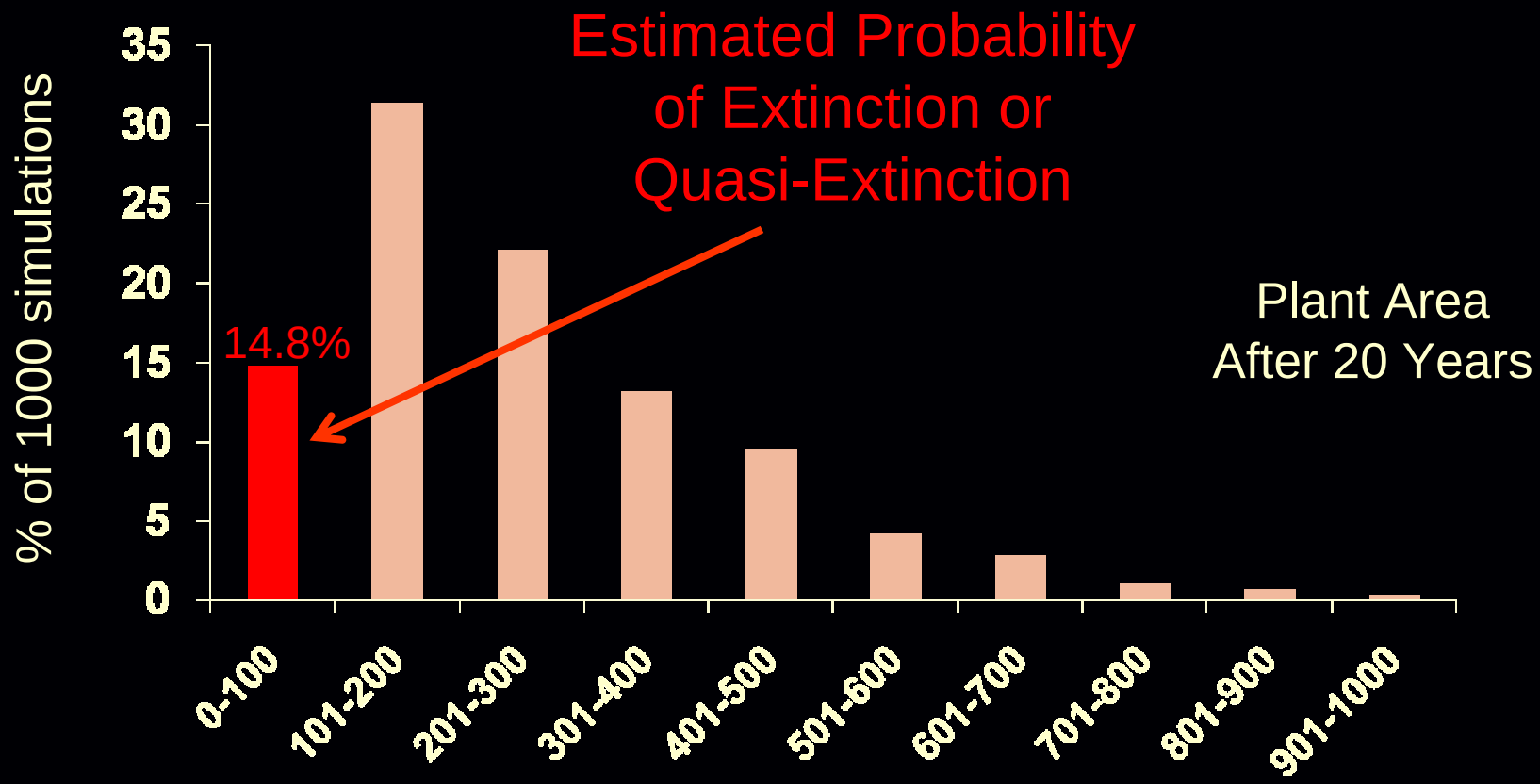
Area < "x" → ~ extinction risk

Note: Model was used as a learning tool and data in slide should only be interpreted as such

Hypothetical Outcomes (Area of TWR in m^2)

Baseline Flow 100-180 Invasive – med. Floating - low Flood - low Recreation - low	Gone	51.7 ←
	<1000	30.3
	1000-3500	13.7
	>3500	4.3
Alt. 1 Flow 50 -100 Invasive – low Floating - low Flood - low Recreation - low	Gone	50.6 ←
	<1000	20.9
	1000-3500	15.2
	>3500	13.4
Alt. 2 Flow 100-180 Invasive – low Floating - med Flood - med Recreation - med	Gone	35.8 ←
	<1000	46.4
	1000-3500	17
	>3500	8

Hypothetical Example Simulation Result



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Draft Influence Diagram
Dryopid Beetle

Questions / Next Steps?

- Workshop - February 29, March 4, or March 5
- Next March RIP Meeting
- SDM Presentation April RIP Meeting