Problem Statement

"Decision Maker (**D**) is trying to do **X** to achieve **Y** over time **Z** and in place **W** considering **B**."

D = the Decision maker(s)
X = the type(s) of action that needs to be taken
Y = the ultimate goal(s) to be achieved by "X"
Z = the temporal extent of the decision problem.
W = the spatial extent of the decision problem
B = potential constraints (legal, financial, and political) and important uncertainties (scientific or other)

"The USFWS, in coordination with state and private landholders, will determine actions to recover the 3 Emerald Forest populations of PPAZ over the next 10 to 20 years. Actions will address limiting factors due to predation, habitat loss, and low recruitment. Key uncertainties associated with population growth and effectiveness of recovery actions will be considered. Reduced budgets constrain direct agency funding of recovery actions and highlight the need for partnerships and consideration of partners' mandates."

[1] Action needed: "Take appropriate management actions to recover the PPAZ"

[2] Trigger: "PPAZ has just been listed as a federally Threatened species." The PPAZ is currently threatened with extinction due potentially to predation by the snowkitkat (SKAT), low dispersal due to habitat fragmentation, and low recruitment due to unknown sources.

[3] Constraints: Budget, legal, federal and state ownership issues, seasonal timing, and, possibly, public perception.

[4] Decision Maker: USFWS in collaboration with State agency and private landowners

[5] Timing and Frequency: There is a one-time decision to identify optimal recover actions that is linked to the recurring decisions on action implementation. To make this linked decision more effective, this could be approached as an opportunity for Adaptive Management. We will discuss this later in the course.

[6] Scope: PPAZ's range (spatial scope); over the next 10-20 years (temporal scope)

[7] Primary Impediment: There are multiple, competing objectives (e.g., timber industry vs. species recovery), and there is incomplete information about the causes of species decline. As a problem class, this would be Multiple Objectives with Reducible Uncertainty associated with population growth and effectiveness of recovery actions.

[8] Framing:
Responses will vary. If framed with State agency as the sole decision maker, then the scope would be limited to state lands, PPAZ recovery would be less prominent, and actions would focus on SKAT harvest, timber harvest, and public access.