Decision Support Tools as Opportunities for Engagement & Communication

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- **Decision Support Tools**

- **Decision Support Tools and Stakeholder Engagement**
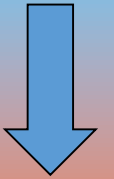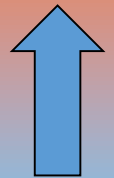
- **Examples in Action**

- **Thread Throughout**
  - **Application for Ecosystem Restoration**

Decision Support Tools

- **Tools that help users visualize and integrate information**
  - **The tools don't make the decisions, they represent the information in ways that makes the process for making a decision transparent**

- **Lots of tools fall under this broad category**
  - **Part art, part science**
  - **Part of the art of using them is determining the most appropriate tool for the task at hand**

- **EPA Office of Research & Development Approach**
  - **Engage Stakeholders in Tool Development**
  - **Eye on Transferability**

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- **Biases**
  - **Wide range of biases influencing decision-making**

- **Complexity**
  - **Technical complexities, risk potential, uncertainties, incomplete information**

- **External Pressures**
 - **Time constraints, political considerations**

Image from ClearerThinking.org

- **Transparent**
  - The **information and process** used are explicitly laid out beforehand and can be tracked by those not involved in the process
  - Competing needs can be **explicitly prioritized**

- **Repeatable***
  - Decisions are made **systematically and uniformly**
  - Those not involved in decision making process could use same inputs & tool would result in the same output

- **Inclusive**
  - Clearly & transparently representing & integrating information used in reaching a decision **allows a broader range of participants to engage** in the decision making process
  - Tools can also be used to **evaluate** the decision **from multiple perspectives**
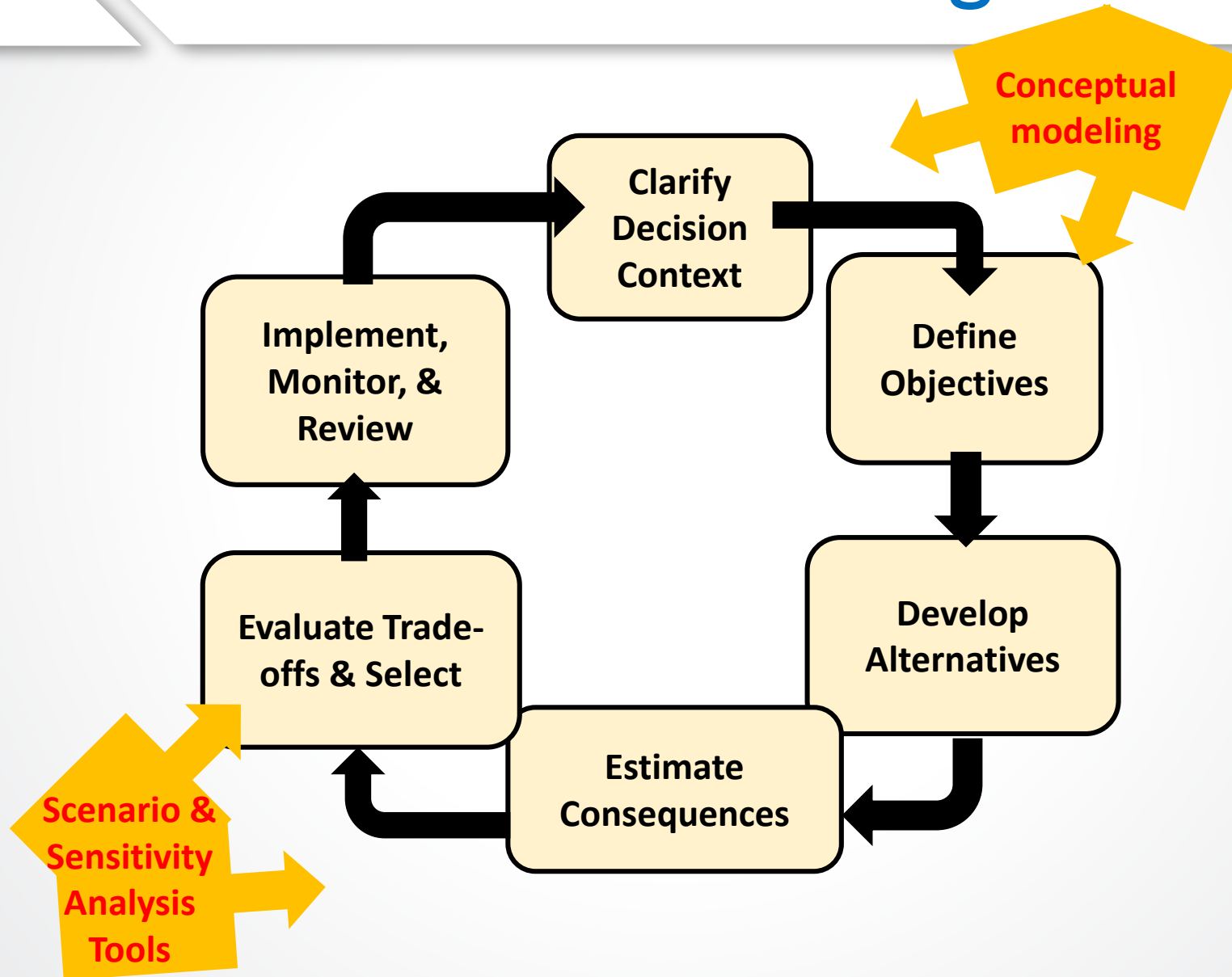
- **Two-way street**
  - **Decision support tools can facilitate stakeholder engagement by:**
    - **Making information used more accessible**
    - **Clearly defining stakeholders' roles**
    - **Showing up front how stakeholder input will be used**
    - **Providing platform for communicating the ultimate decisions & rationale behind them to stakeholders**

  - **Stakeholder engagement can enhance decision support tool application by:**
    - **Identifying where in the decision-making process tools would be most useful**
    - **Identifying most pressing questions for a tool to address**
    - **Providing additional information & perspectives for inclusion in the process**

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- **Buy-in**
  - **Identify if it will be accepted**
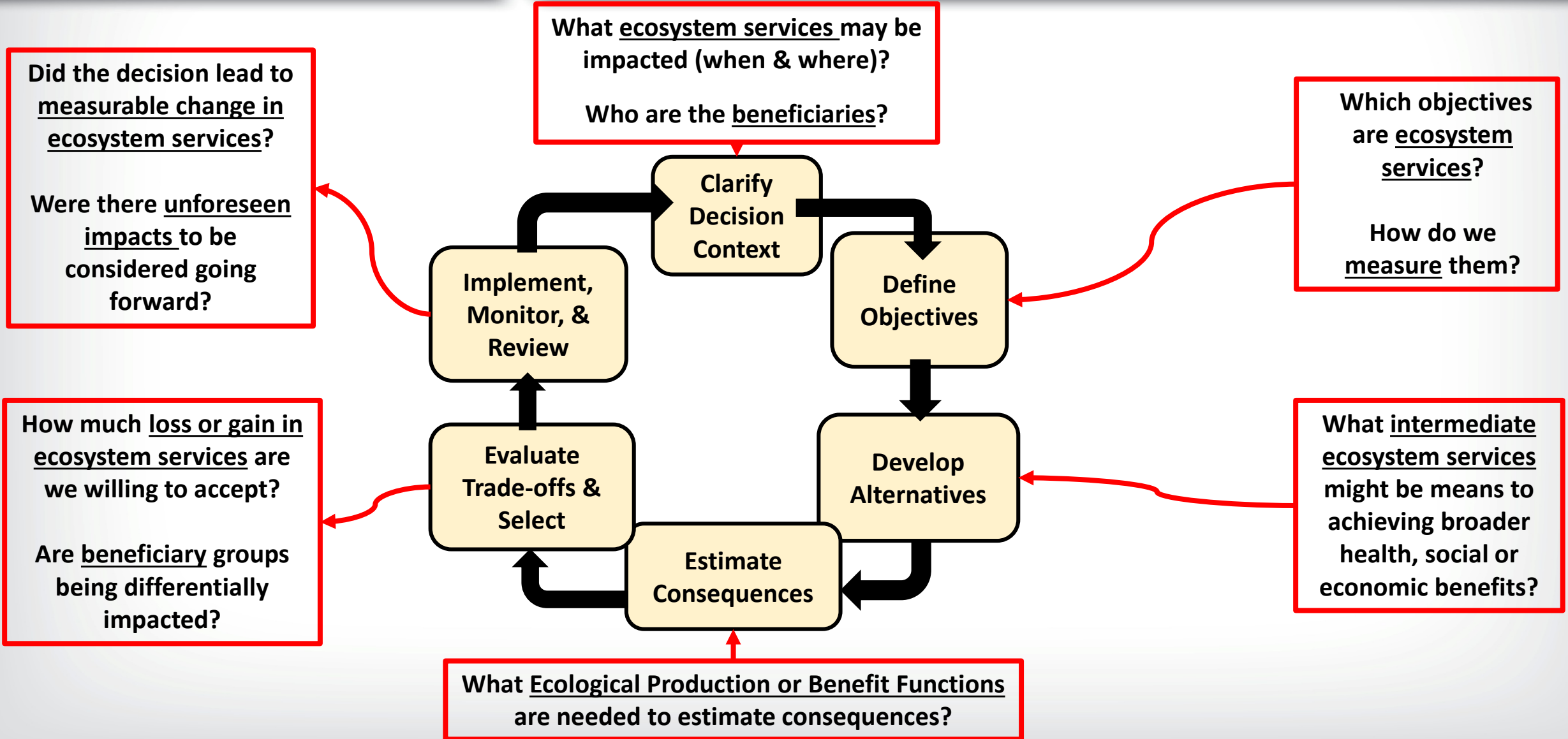- **Representation in process**
  - **Who incorporate**
  - **How incorporate**
- **Communication**
  - **Shape how information is received**
- **Project Success**
  - **Avoid *Ad-hoc***
  - **Engagement vs. participation**
  - **Better informed & more legitimate decisions**

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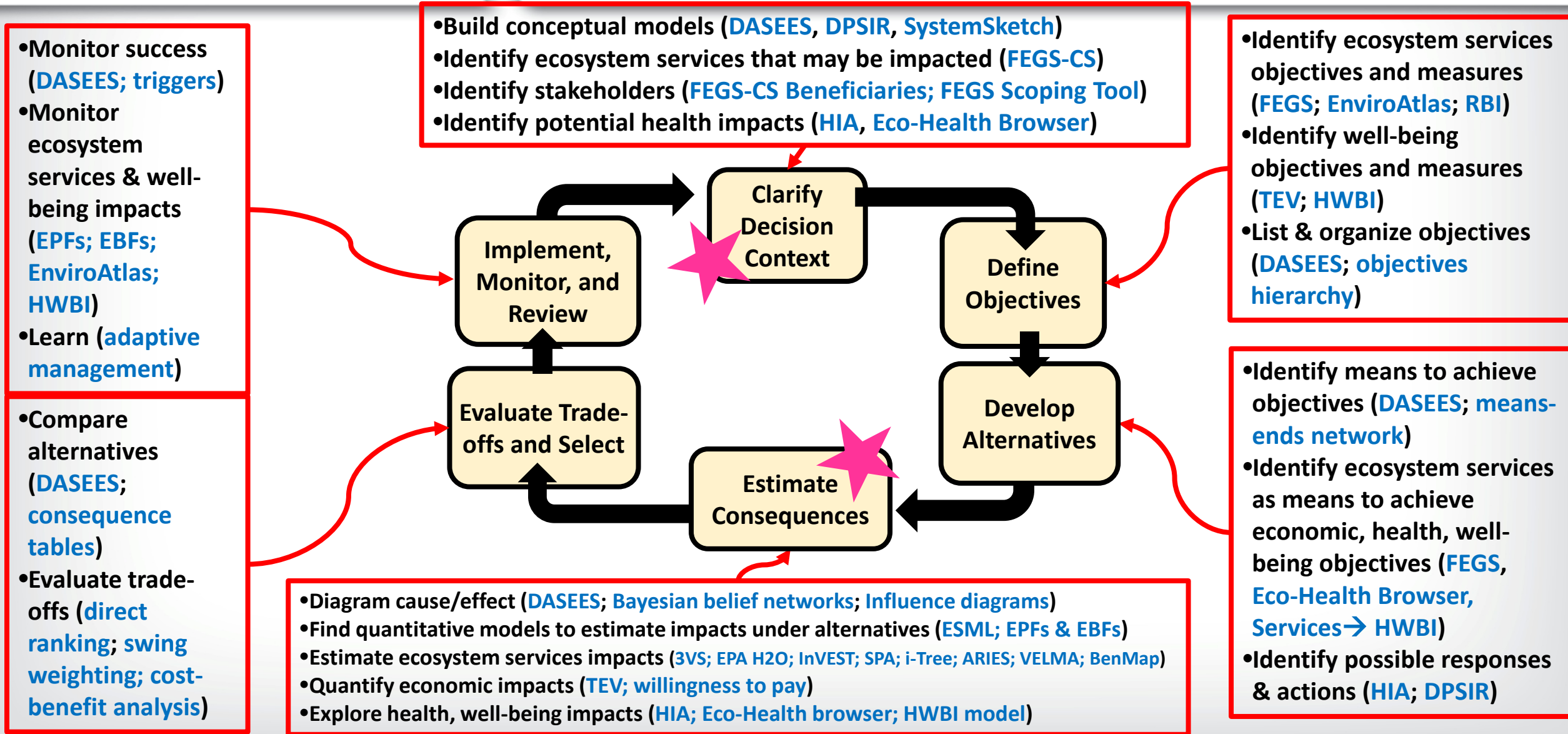*han-solo-points-never-forget-stakeholder-engagement*

DST for Incorporating Ecosystem Services into Decision Making

What <u>ecosystem services</u> may be impacted (when & where)?

Who are the <u>beneficiaries</u>?

Did the decision lead to <u>measurable change in ecosystem services</u>?

Were there <u>unforeseen impacts</u> to be considered going forward?

Which objectives are <u>ecosystem services</u>?

How do we <u>measure</u> them?

How much <u>loss or gain in ecosystem services</u> are we willing to accept?

Are <u>beneficiary</u> groups being differentially impacted?

What <u>intermediate ecosystem services</u> might be means to achieving broader health, social or economic benefits?

Clarify Decision Context

Define Objectives

Implement, Monitor, & Review

Develop Alternatives

Evaluate Trade-offs & Select

Estimate Consequences

What <u>Ecological Production or Benefit Functions</u> are needed to estimate consequences?

DST for Incorporating Ecosystem Services into Decision Making

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- **Build conceptual models (DASEES, DPSIR, SystemSketch)**
- **Identify ecosystem services that may be impacted (FEGS-CS)**
- **Identify stakeholders (FEGS-CS Beneficiaries; FEGS Scoping Tool)**
- **Identify potential health impacts (HIA, Eco-Health Browser)**

- **Monitor success (DASEES; triggers)**
- **Monitor ecosystem services & well-being impacts (EPFs; EBFs; EnviroAtlas; HWBI)**
- **Learn (adaptive management)**

- **Compare alternatives (DASEES; consequence tables)**
- **Evaluate trade-offs (direct ranking; swing weighting; cost-benefit analysis)**

- **Identify ecosystem services objectives and measures (FEGS; EnviroAtlas; RBI)**
- **Identify well-being objectives and measures (TEV; HWBI)**
- **List & organize objectives (DASEES; objectives hierarchy)**

- **Identify means to achieve objectives (DASEES; means-ends network)**
- **Identify ecosystem services as means to achieve economic, health, well-being objectives (FEGS, Eco-Health Browser, Services→ HWBI)**
- **Identify possible responses & actions (HIA; DPSIR)**

Cycle diagram nodes:
- Clarify Decision Context
- Define Objectives
- Develop Alternatives
- Estimate Consequences
- Evaluate Trade-offs and Select
- Implement, Monitor, and Review

- **Diagram cause/effect (DASEES; Bayesian belief networks; Influence diagrams)**
- **Find quantitative models to estimate impacts under alternatives (ESML; EPFs & EBFs)**
- **Estimate ecosystem services impacts (3VS; EPA H2O; InVEST; SPA; i-Tree; ARIES; VELMA; BenMap)**
- **Quantify economic impacts (TEV; willingness to pay)**
- **Explore health, well-being impacts (HIA; Eco-Health browser; HWBI model)**

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- **FEGS Scoping Tool**
  - **A tool designed for community decision-makers use at an early project scoping stage**
  - **Used to help identify and prioritize ecosystem services for a particular decision/decision context**
  - **Prioritize stakeholders**

  - **Leah Sharpe Presentation**
   - **Wed 140 PM   Salon H   Session 29**
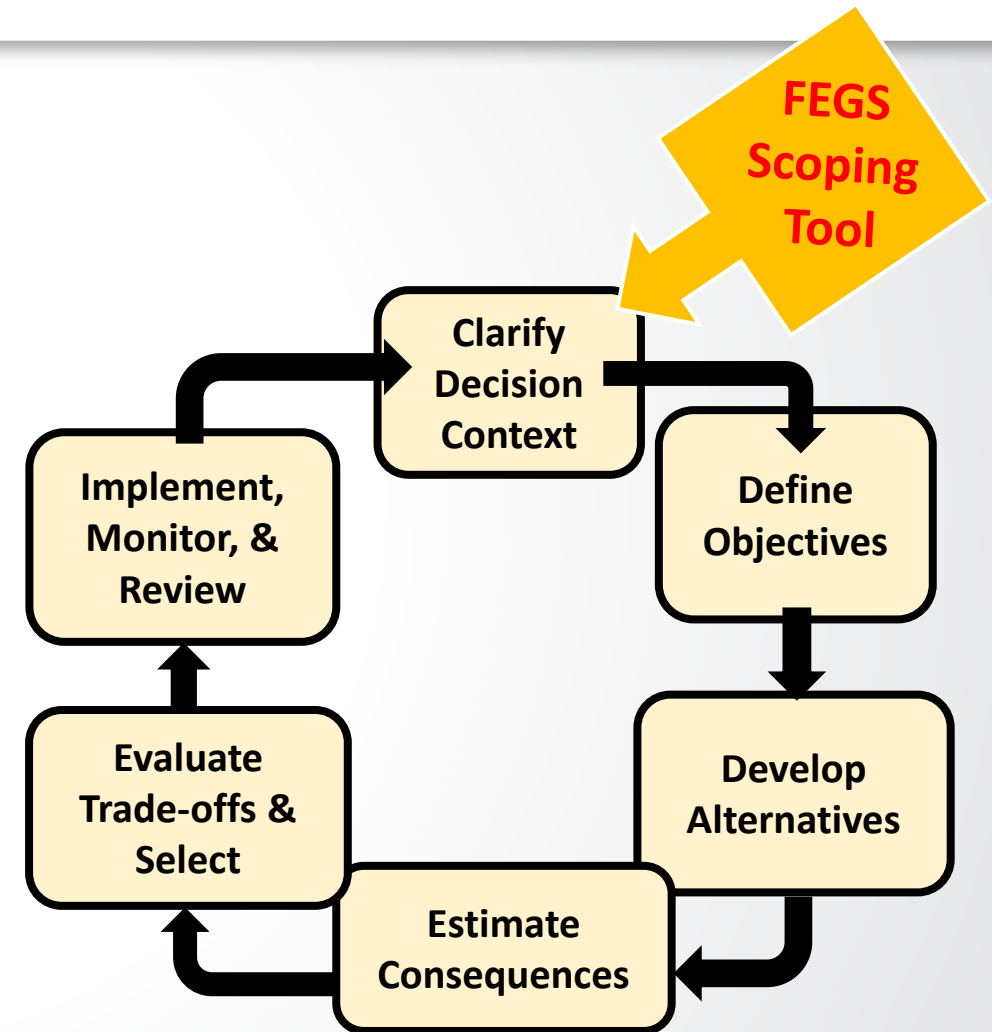
FEGS Scoping Tool

Clarify Decision Context

Define Objectives

Develop Alternatives

Estimate Consequences

Evaluate Trade-offs & Select

Implement, Monitor, & Review

Improves the decision making process by:

- **Identifying the most relevant attributes for the decision process**
- **Explicitly connecting stakeholder groups to their roles (i.e., how they use/benefit from the ecosystem)**
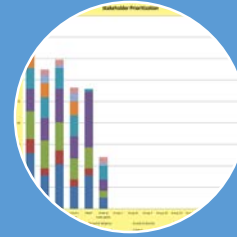
Stakeholder Prioritization
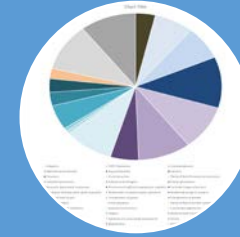
Beneficiary Profile

Key Attribute Identification

Supports stakeholder engagement by:

- **Explicitly incorporating the stakeholder perspective**
- **Allowing decision makers to be transparent about the factors involved with a given stakeholder group's relative influence**

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- **Rapid Benefits Indicator Tools**
  - A **systematic approach** to compiling non-monetary indicators of wetland restoration benefits
  - Grounded in **economic theory**
  - Examine different decisions when based primarily on **ecological objectives or benefits to people**

  - **Justin Bousquin Presentation**
    - **Wed 220 PM   Salon H   Session 29**

Clarify Decision Context

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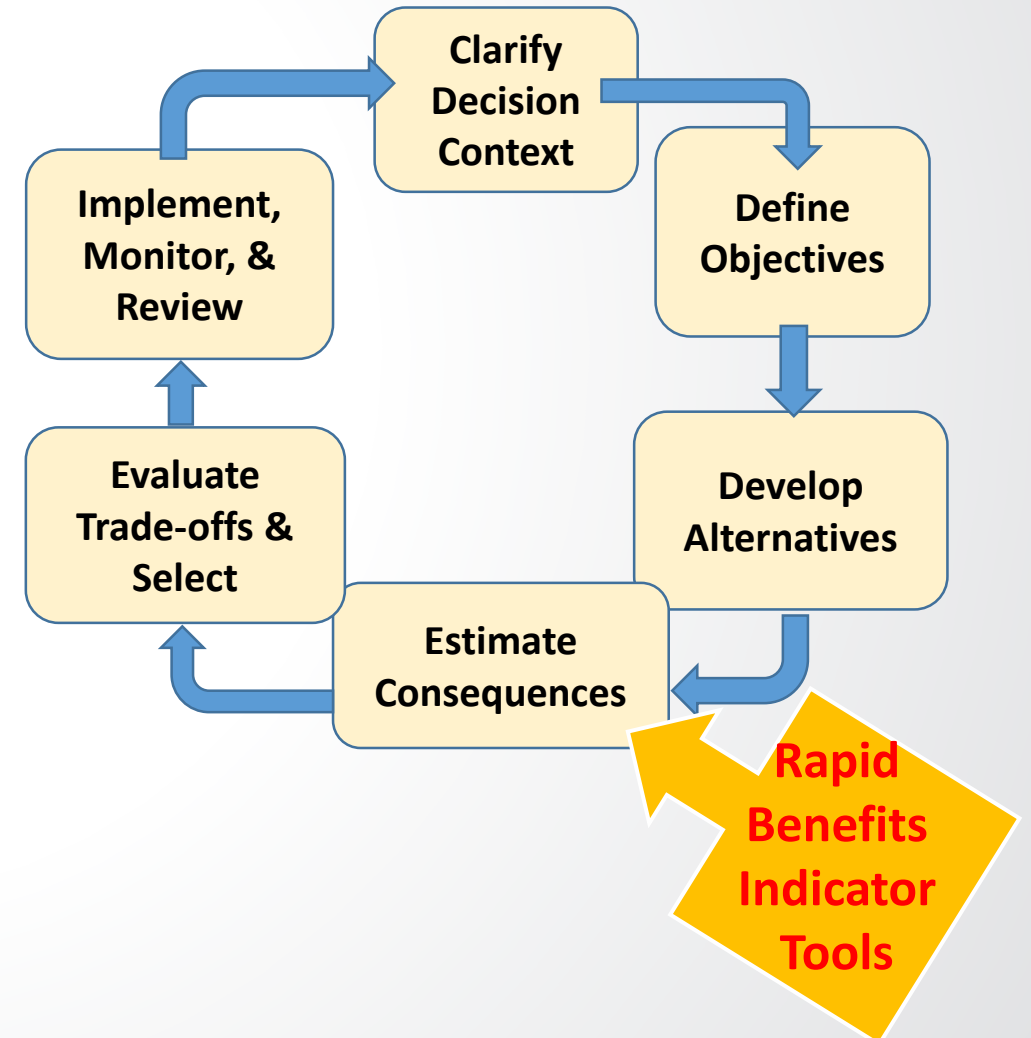
Rapid Benefits Indicator Tools

Improves the decision making process by:

- **Identifying who may benefit from different options**
- **Summary reports of relevant site-specific features/attributes**
- **Prioritizing restoration sites based on transparent systematic approach**

Supports stakeholder engagement by:

- **Identifying tradeoffs in options**
- **Articulating the benefits to people for a given functional assessment**
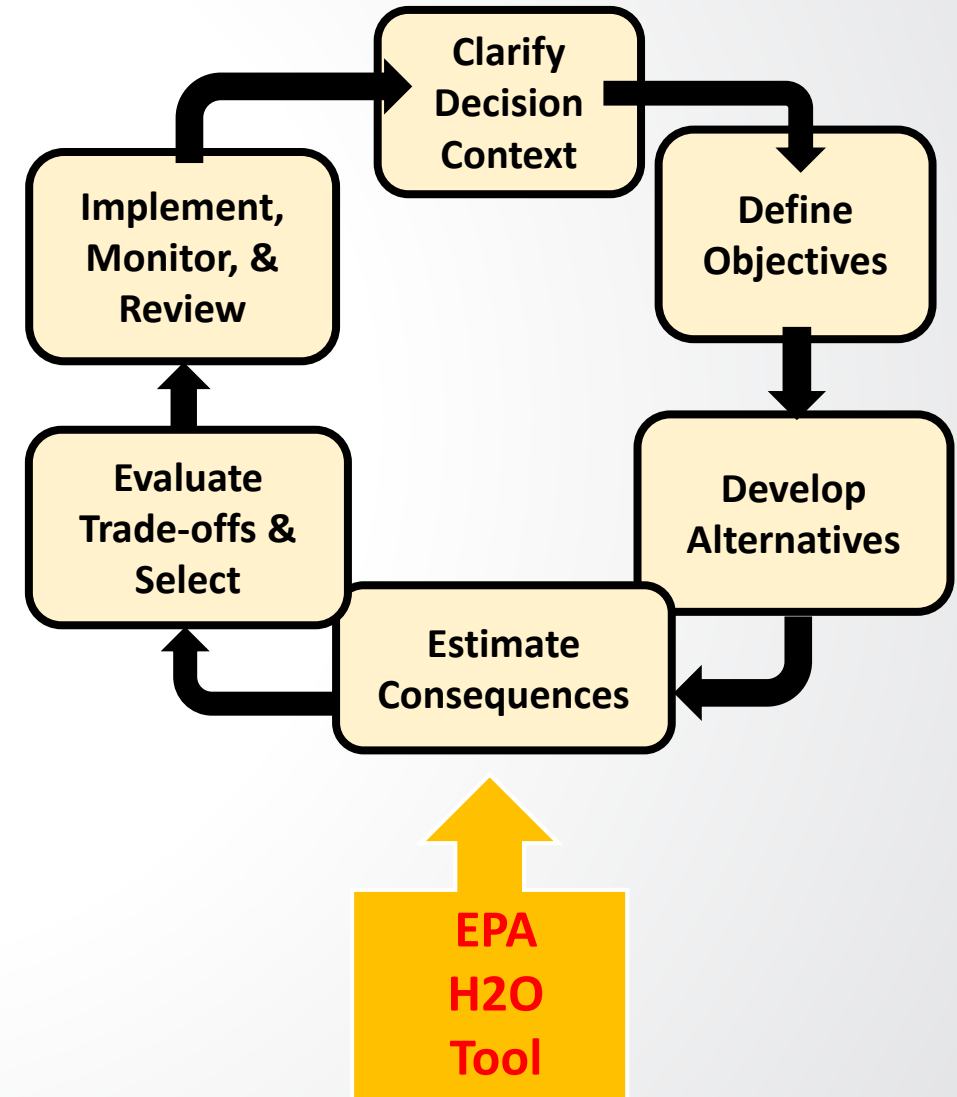
- **EPA H2O Tool**
  - **A tool designed for community decision-makers to use for analyzing land-use scenarios**
  - **Used to summarize changes in ecosystem services production at local neighborhood and regional scales in common units ($)**

  - **Marc Russell Presentation**
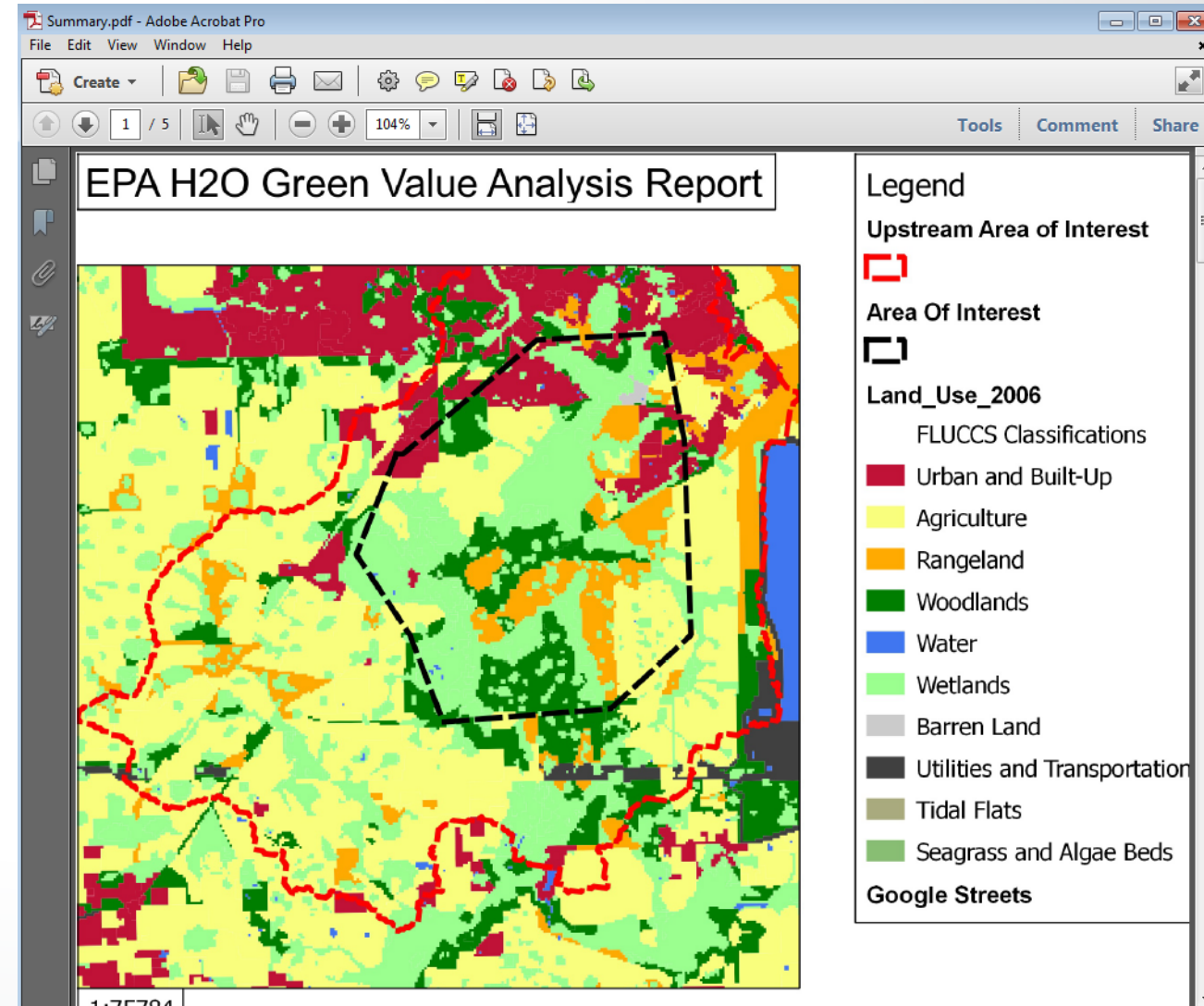   - **Wed 200 PM   Salon H   Session 29**

Improves the decision making process by:

- **Summarizing reports (pdf) of EGS upstream and within area of interest**
- **Comparing side by side differences of alternative future land use scenarios**

Supports stakeholder engagement by:

- **Allowing on-the-fly land cover changes for exploring options**
- **Having a graphical user interface designed for basic or advanced users**
- **Being based on Open Source Q-GIS software (i.e., no license needed)**

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