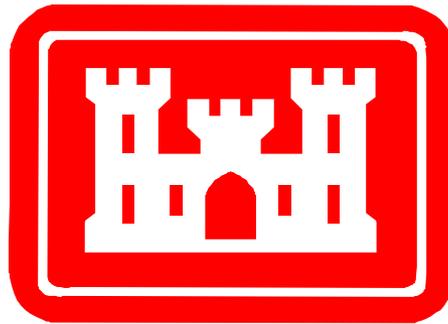


---

# Environmental Windows as a Risk Management Practice



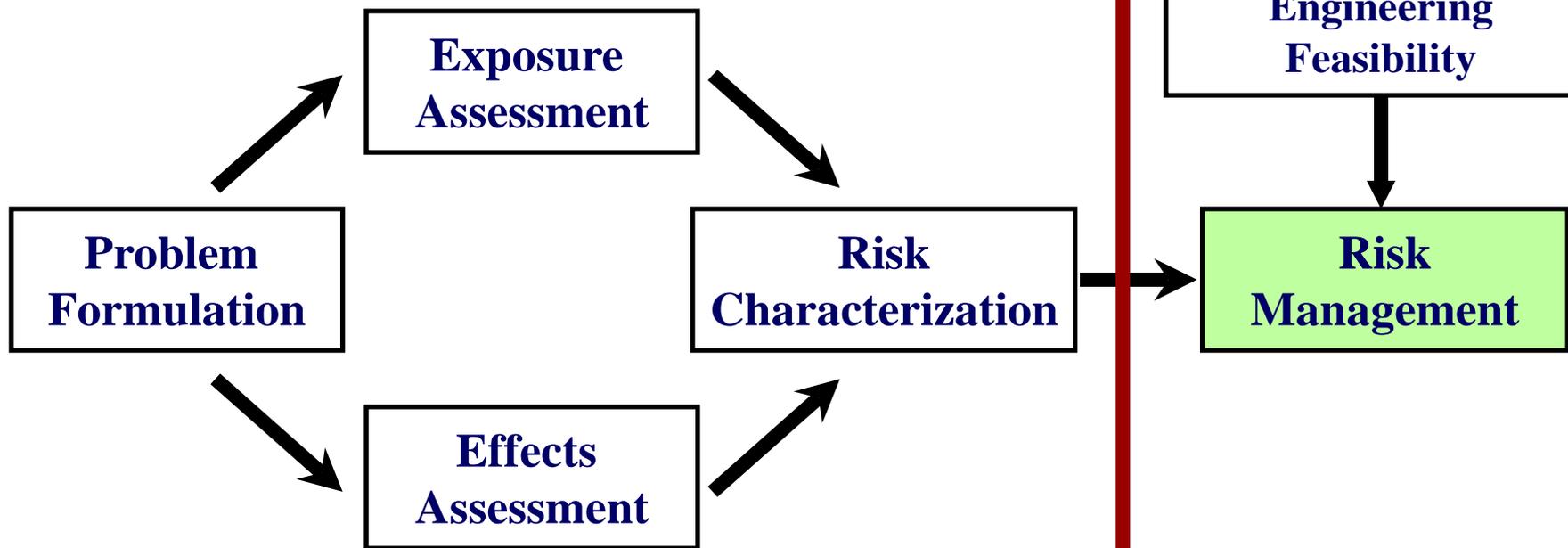
**Doug Clarke**

*[Douglas.G.Clarke@usace.army.mil](mailto:Douglas.G.Clarke@usace.army.mil)*



# RISK FRAMEWORK

## RISK ASSESSMENT PARADIGM



$$\text{Risk} = f(\text{Exposure} + \text{Effect})$$



---

***Environmental Window*** - a period during which dredging may occur

***Seasonal Restriction*** - a period during which dredging is not allowed



# AUTHORITIES

---

**Federal Consistency Requirements**

**Clean Water Act**

**Fish & Wildlife Coordination Act**

**Environmental Window**

**Endangered Species Act  
Biological Opinions**

**Essential Fish Habitat**

**Section 401 Water Quality Certification**



# Issues That Lead to Windows

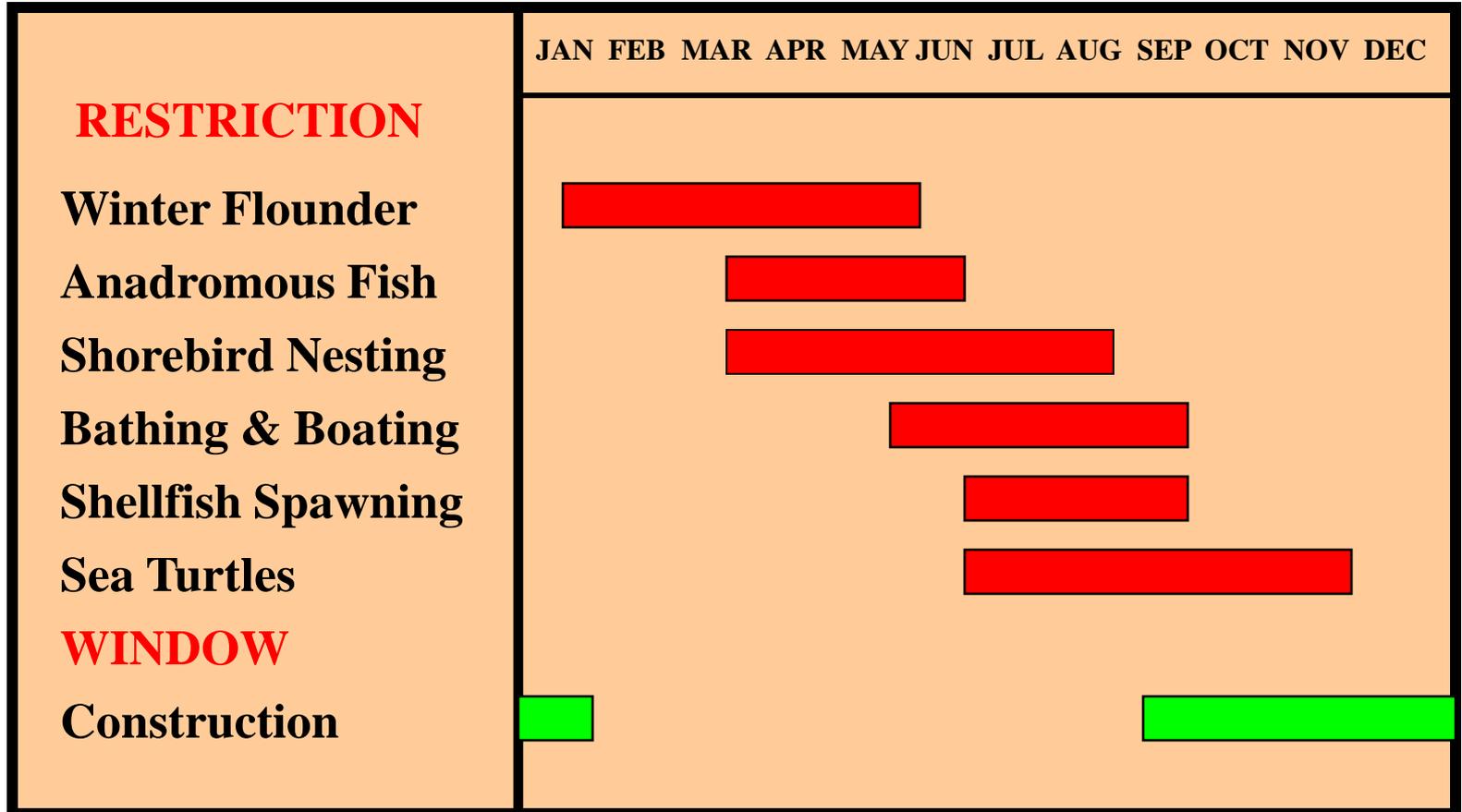
---

- **Contaminated Sediments**
- **Sediment re-suspension effects**
  - **Turbidity**
  - **Total Suspended Solids**
- **Hydraulic entrainment**
- **Sedimentation effects**
- **Noise**
- **T&E species protection**



# CUMULATIVE WINDOWS

## EXAMPLE: HYANNIS HARBOR, MA PROJECT FILE



# Cost Inflation

---

- **Windows tend to restrict dredging to winter months**
  - **Dredge availability**
  - **Competition**
  - **Safety issues**
  - **Higher fuel costs**
  - **Higher mobilization/demobilization costs**
  - **Crew “down time”**
  - **Inflexible contracting**



# Consequences of Environmental Windows

---

- **Protracted project schedules and delays**
- **Rising costs per cubic yard of sediment dredged**
- **Contentious coordination pitting the need to dredge against the *Precautionary Principle***



# The Precautionary Principle

---

- ***When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically.***

(from the 1998 Wingspread Statement)



# The Precautionary Principle in Practice

---

- The PP is intended to be a *risk-adverse* approach and endorses *adaptive* management practices
- Under the PP, precautions are intended to be *preliminary* measures pending completion of risk assessment
- Precautions are *not an endpoint*, but a *starting point* in a search for alternatives
- “The litmus test for knowing when to apply the PP is the combination of *threat of harm and scientific uncertainty*” (Tickner, 1999)



# THE PROPORTIONALITY RULE

---

- **The applied precaution should be proportional to the degree of risk**
- **To apply a risk management approach, acceptance of this rule is a prerequisite**



---

**An environmental window is an off switch, not a dimmer switch. By default applying a window infers that no risk is acceptable.**



# Current Practice

---

- **Since passage of NEPA environmental windows have become a pervasive management practice applied as a “first line of defense”**
- **Frequently an EW is stipulated in the WQC in tandem with other turbidity/TSS controls**
- **Institutionalized EWs are seldom re-evaluated or refined based on objectively determined levels of risk**



# “BEST” or “BAD” Management Practice?

**DEPLOY SILT  
CURTAIN**

**SLOW HOIST  
SPEED**

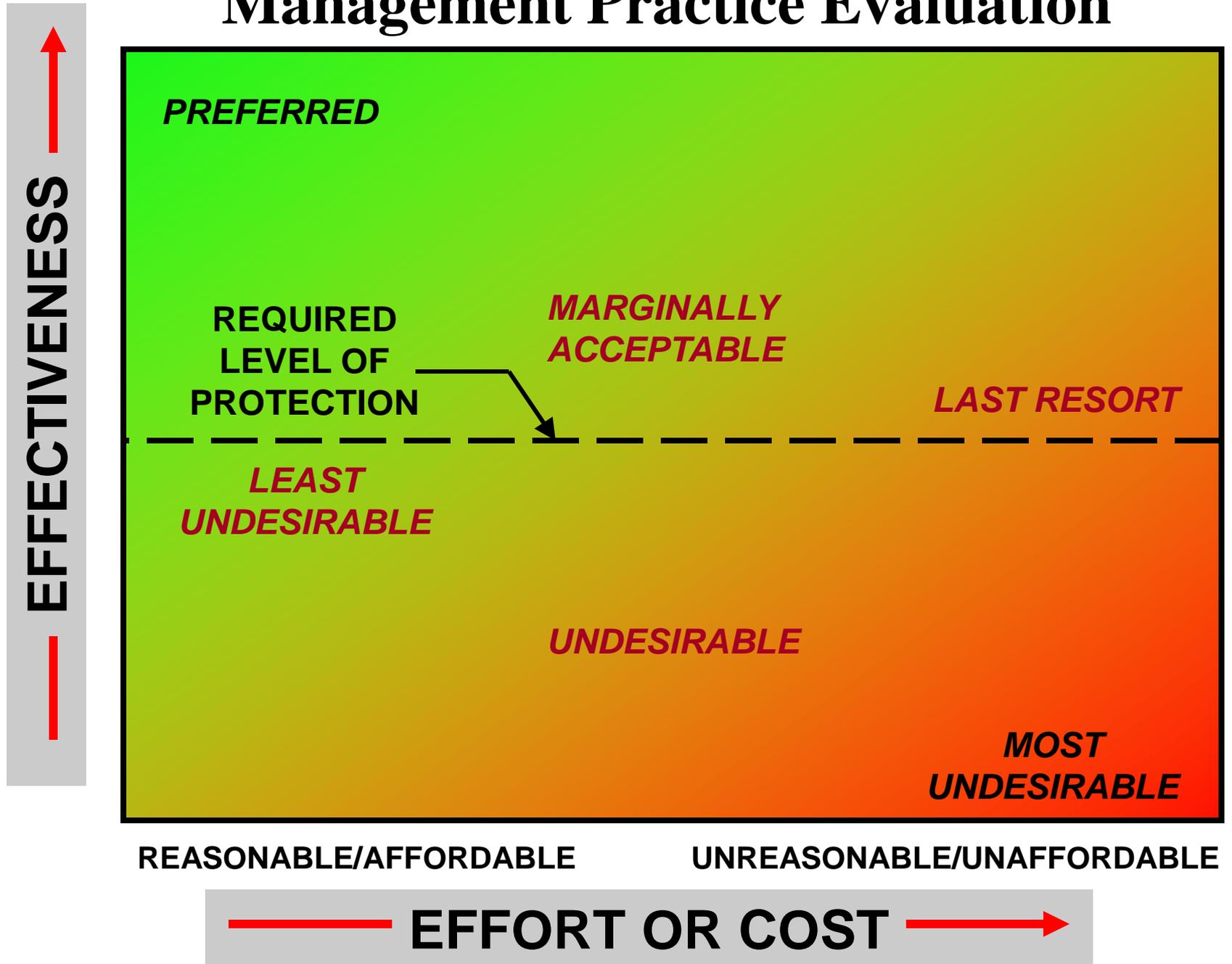
**USE CLOSED  
BUCKET**

**ENVIRONMENTAL  
WINDOW**

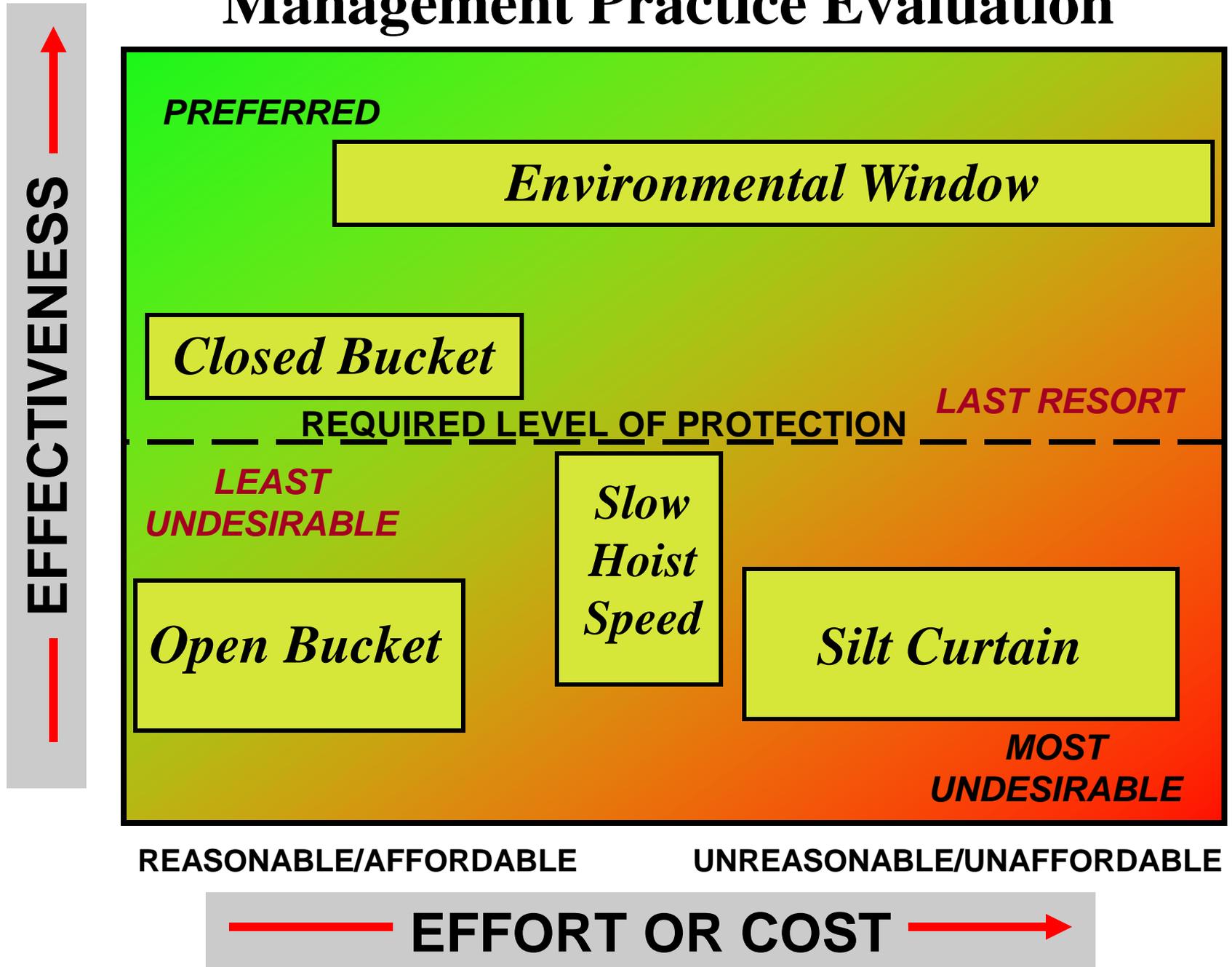
**PERCEIVED RISK**



# Management Practice Evaluation



# Management Practice Evaluation



# Hypothetical Example

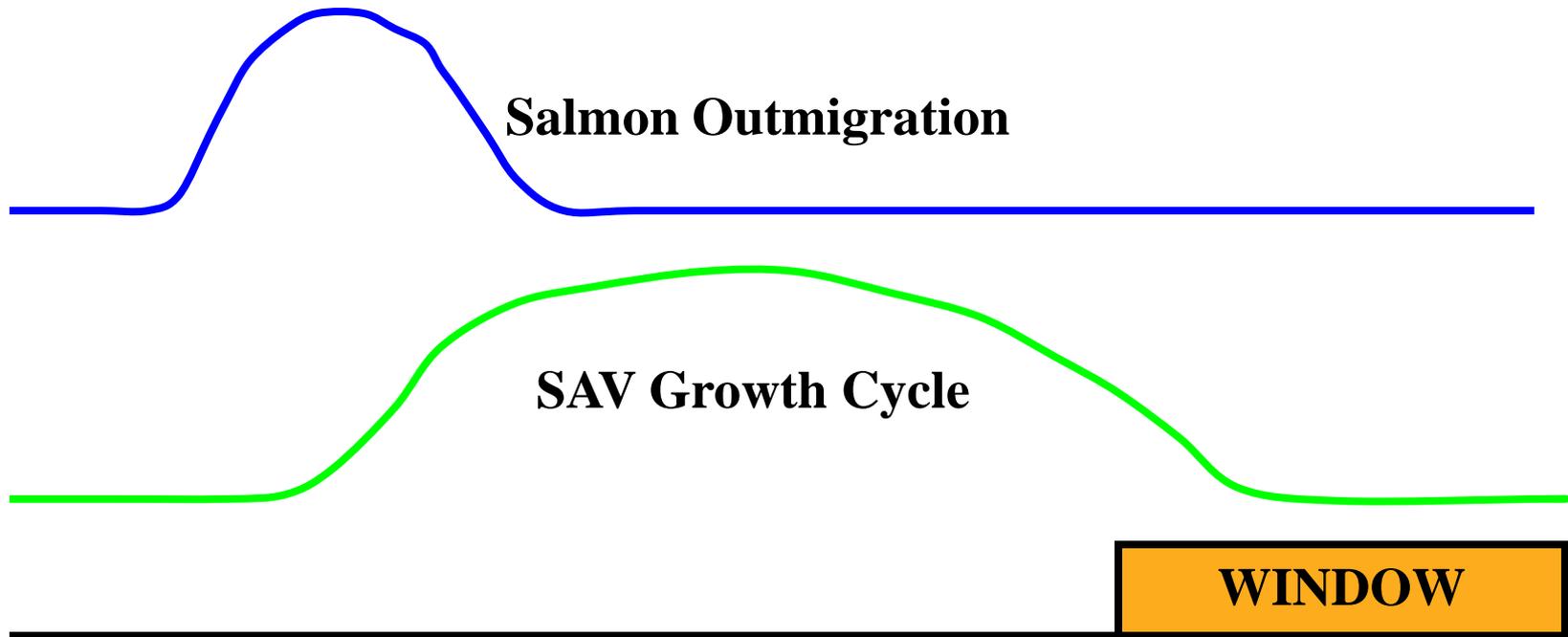
---

**SPRING**

**SUMMER**

**FALL**

**WINTER**



**Salmon Outmigration**

**SAV Growth Cycle**

**WINDOW**



# RISK-INFORMED DECISIONS

---

- ***Biology***

- Life history stage
- Habitat
- Seasonality
- Vulnerability

- ***Dredging***

- Type
- Performance
- Waterway
- Temporal/Spatial Scales



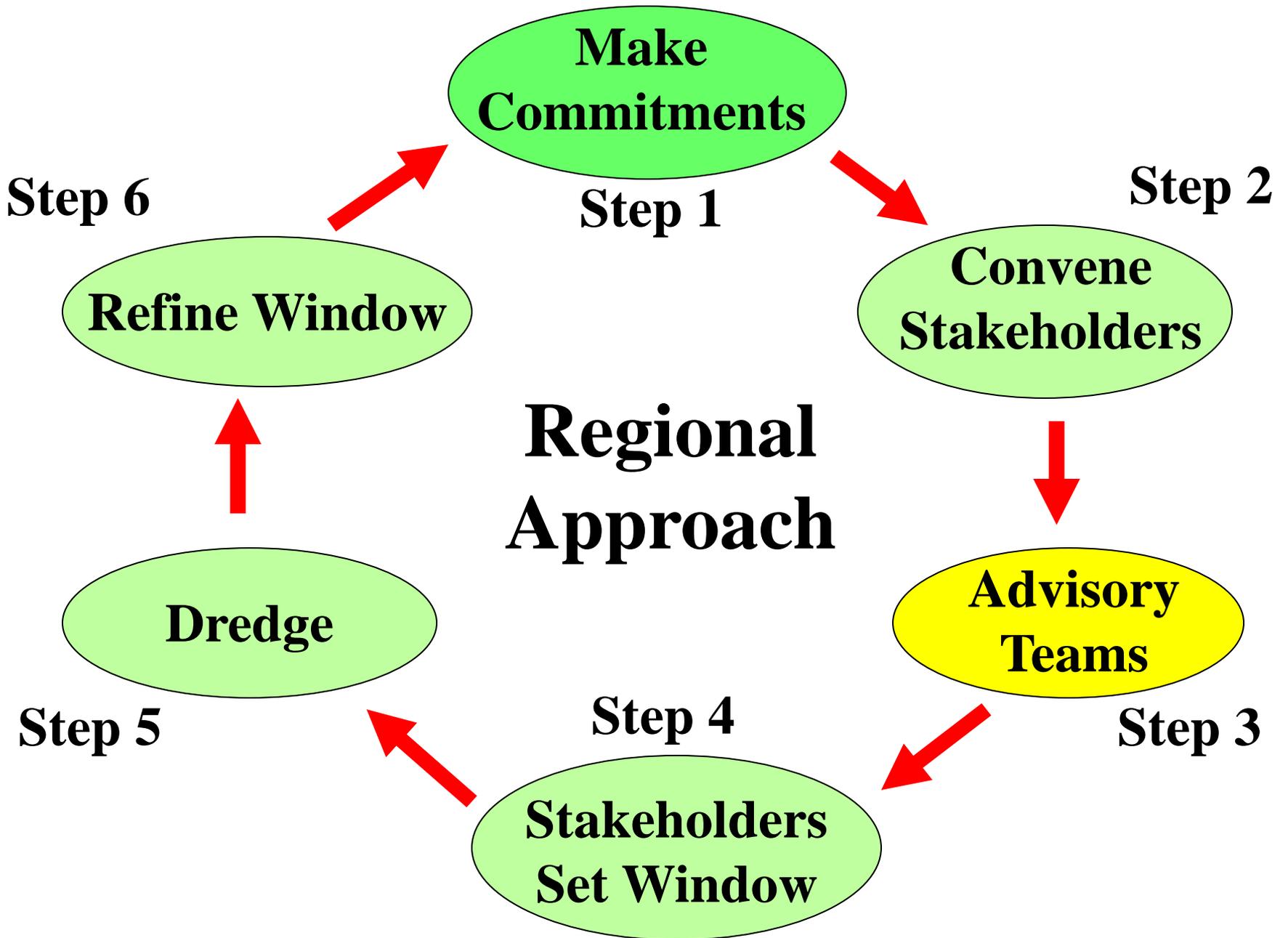
# National Research Council

---

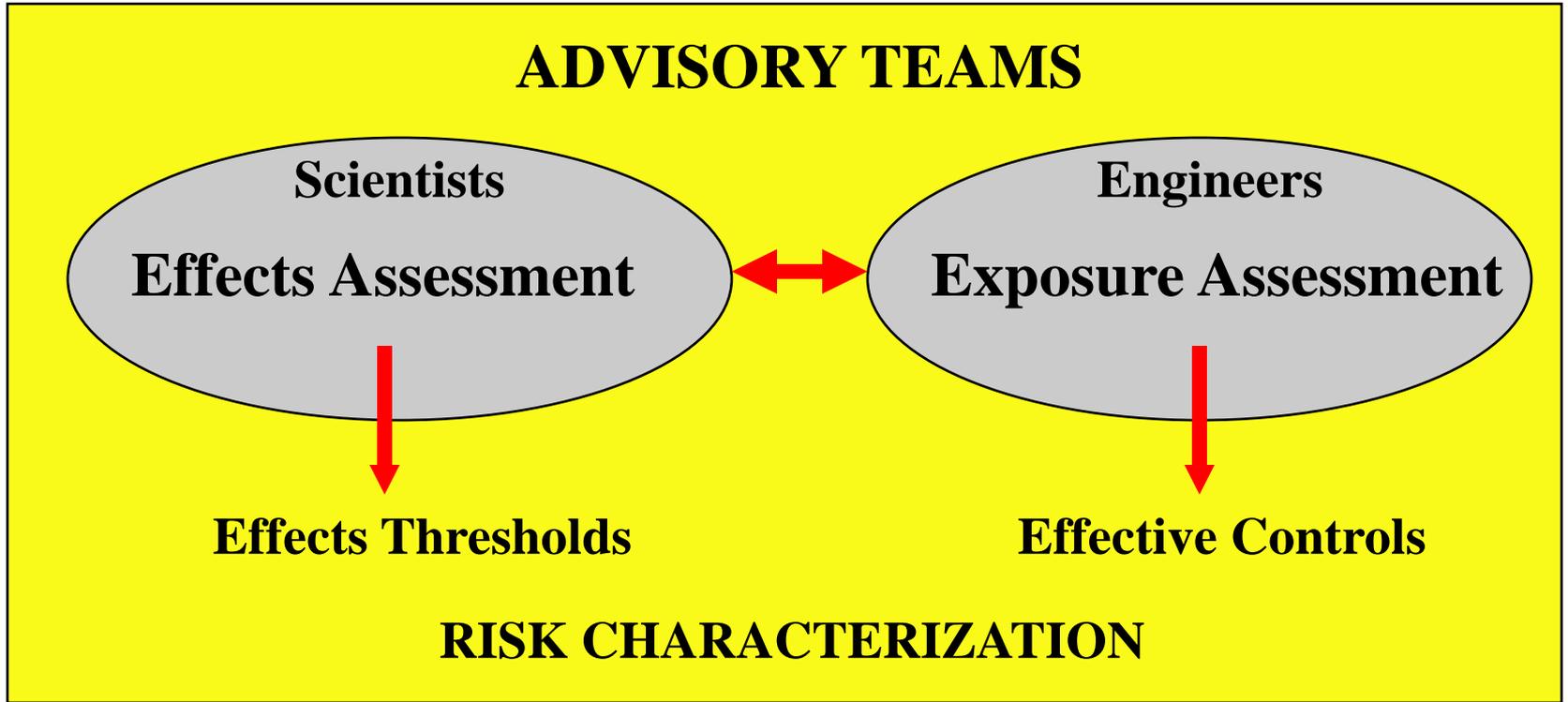
2001

## A Process for Setting, Managing, and Monitoring Environmental Windows





### STEP 3



### STEP 4



# REQUIRED!!!

**STEP 6**

**REFINE  
WINDOW**

**ADAPTIVE  
MONITORING**

**DREDGE**

**STEP 5**



# Pitfalls in the Present System

---

- **Burden of proof of acceptable risk lies on the dredging community, but targets are fuzzy**
- **Often weak documentation of effects**
- **A majority of resource agencies do not have staff dedicated to the dredging process**
- **Resource agencies have insufficient funds for dredging research or training**
- **Little incentive exists to change the status quo**



# Recommendations

---

- **Consider all management practices on an equal basis with windows (e.g., silt curtains, closed buckets, buffer zones, etc.)**
- **Accept windows as a potentially useful tool based on the merits of a given project and specific sources of risk**
- **Do not institutionalize windows, but invest in development of alternatives**



# Recommendations

---

- **Seek science-based, adaptive alternatives**
- **Obtain commitments to resolve major concerns**
- **Explore ecological risk-based methods to setting windows**
- **Increase understanding of the dredging process**
- **Increase awareness of conservation needs among dredgers**



# Conclusions

---

- **Environmental windows as commonly implemented are a non-adaptive management practice and represent an imperfect application of the precautionary principle**
- **Progress beyond a perfunctory acceptance of windows as the management practice of first resort requires commitment from all stakeholders**

