

Idaho National Engineering and Environmental Laboratory

Some Characteristics of Good Environmental Decision Processes

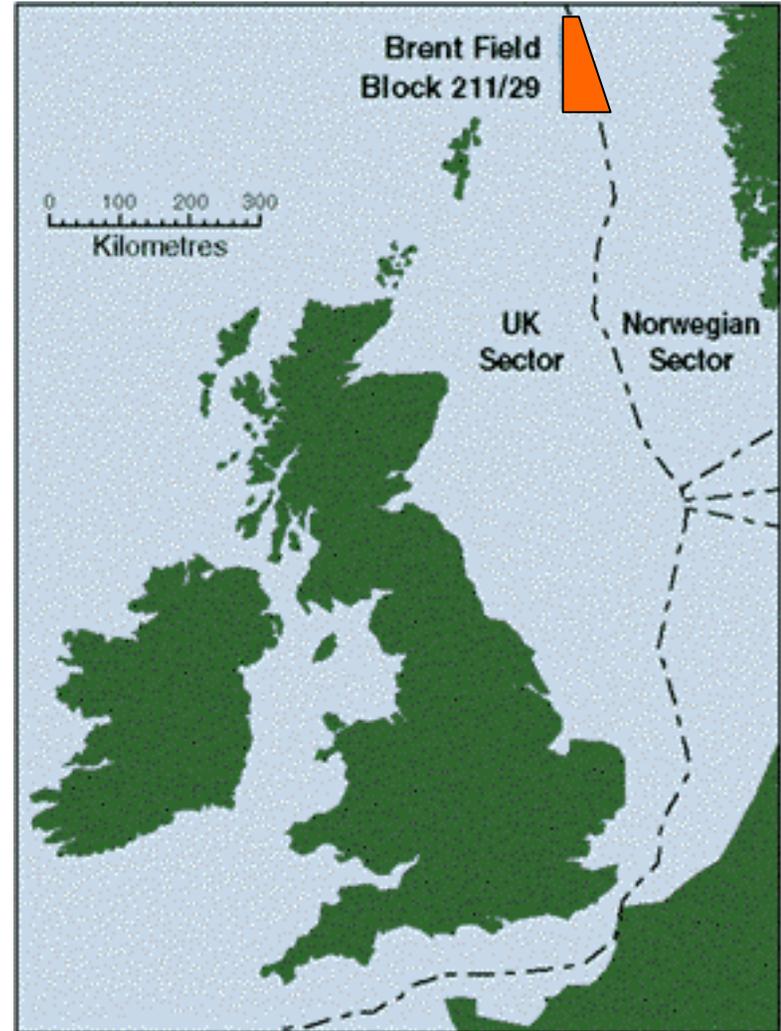
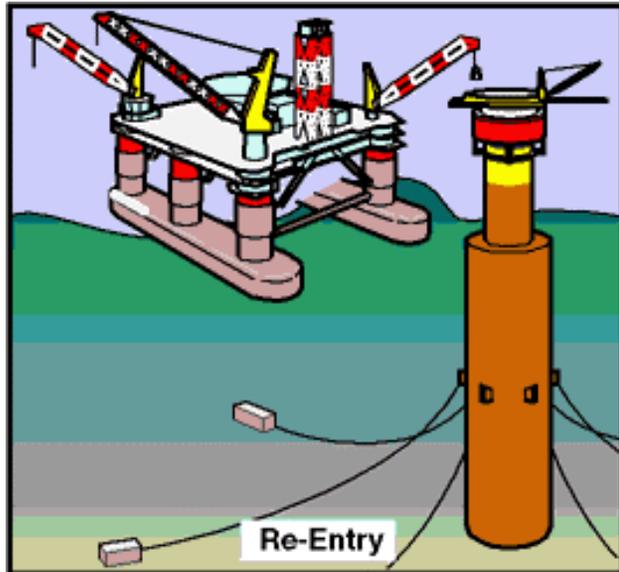
Jerry L. Harbour, Ph.D.



**Home of Science
and Engineering Solutions**

July 31, 2001

Brent Spar Case Study



Identified Decommissioning Options

- *Leave in place*
- *Sell to another oil company*
- *In-field disposal*
- *Disposal on land*
- *Deep-sea disposal*

BPEO



... work had essentially followed our normal technical procedure and regulatory compliance, but with limited analysis of potentially wider issues and external sensibilities. -- Fran Morrison 1998

Issue Became Highly Volatile and Visible

- ***Germany's Helmut Kohl informed England's John Major that stopping the sea dumping of Brent Spar was not "the looniness of a few greens but a Europe-wide, worldwide trend for the protection of our seas."***
- ***EU Commissioner for the Environment Ritt Bjerregaard accused Shell of "environmental vandalism."***

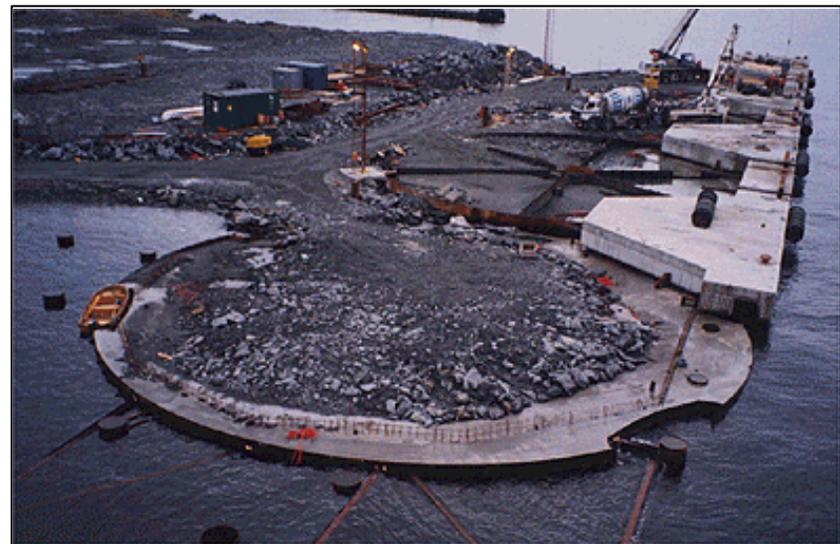


**Over the side
is over.**

Adopted a New Decision Approach

... involved a new, independently facilitated Dialogue, giving us opportunities to listen and giving participants opportunities to question and share views and values.

-- Fran Morrison 1998



Some Gained Insights

Brent Spar has transformed our outlook. ... it will go down in history as a symbol of the industry's inability to engage with the outside world.

-- Heinz Rothermund, 1997

- ***“... we must be more open and transparent.***
- ***In controversial matters, good science and regulatory compliance aren't enough.***
- ***We must explain complex issues, but simply.”***

-- Fran Morrison 1998

Good Decisional Processes & Frameworks should ...

- **Inclusive**
- **Open and Understandable**
- **Allow for Broad Framing**
- **Robust and Adaptive to Change**

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Inclusive of ...

- **Diverse groups, values, and knowledge**
- **Science**
- **Technology**
- **Risk**
- **Cost**
- **Intergenerational effects**
- **Different techniques, methods, and tools**
- **and whatever else that's needed to make a good decision!**

Involvement in Dam Siting Decisions

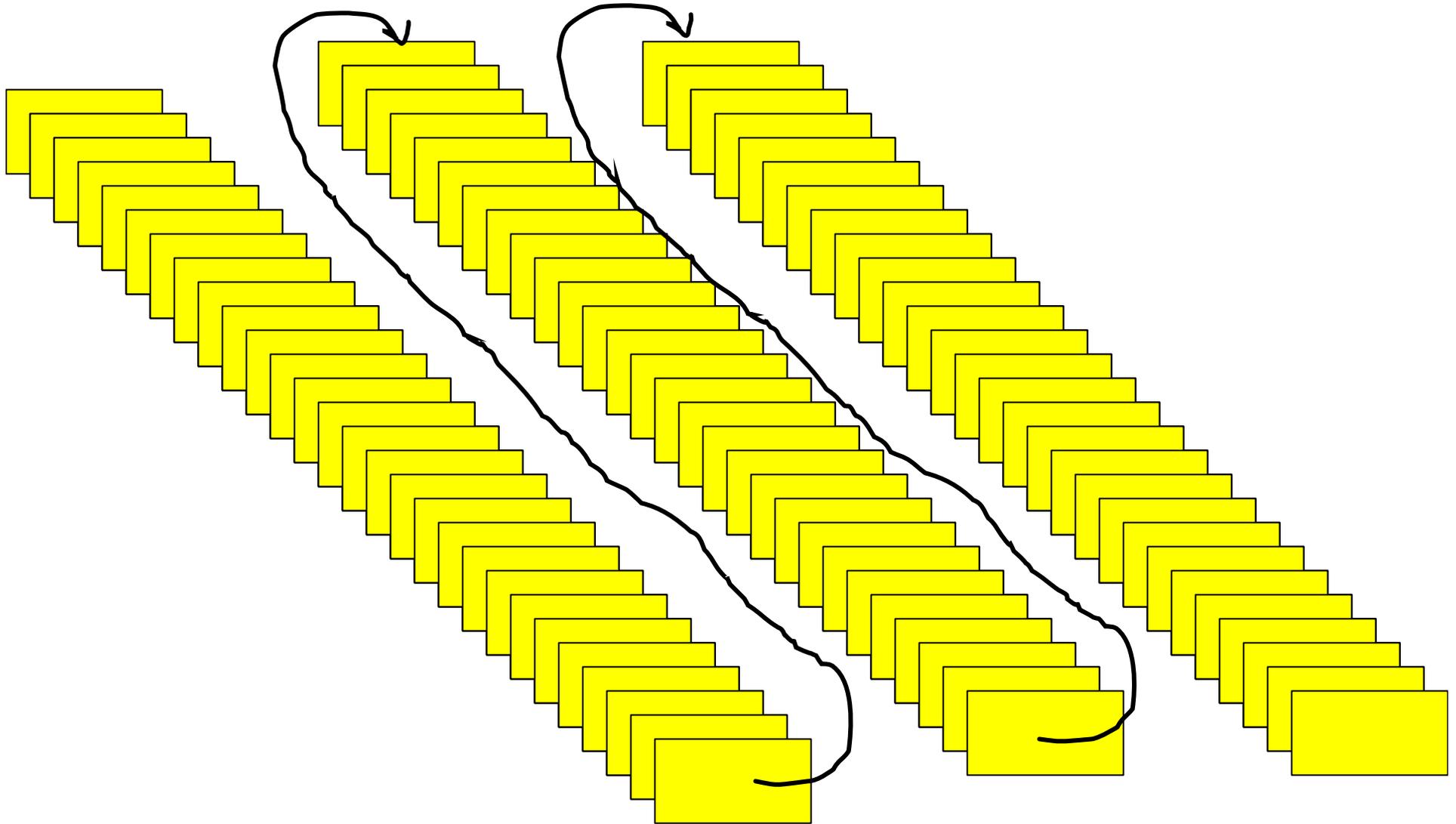
	Pre-WWII	Post-WWII	Late 1970s	Late 1980s	Early 1990s	Mid 1990s	Early 2000s
Engineers	✓	✓	✓	✓	✓	✓	✓
Economists		✓	✓	✓	✓	✓	✓
Environmentalists			✓	✓	✓	✓	✓
Sociologists				✓	✓	✓	✓
Affected People					✓	✓	✓
Non-government Orgs						✓	✓
Public “Acceptance”							✓

(from Goodland, 1997)

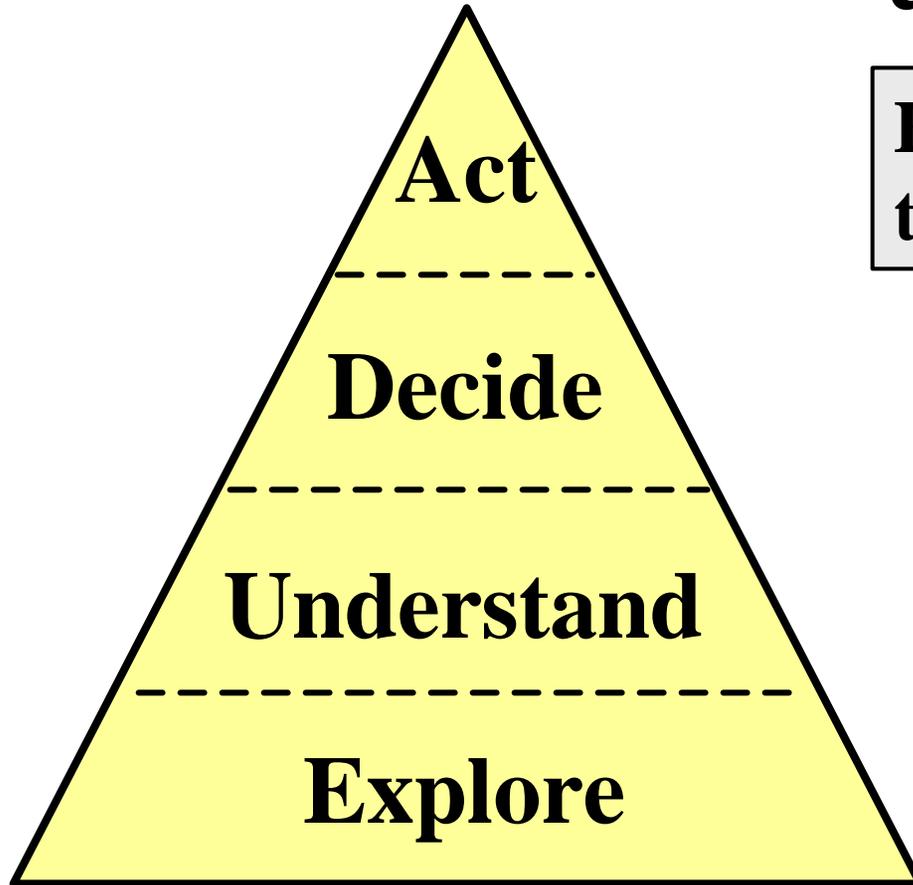
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“Non-transparent” Decision Processes



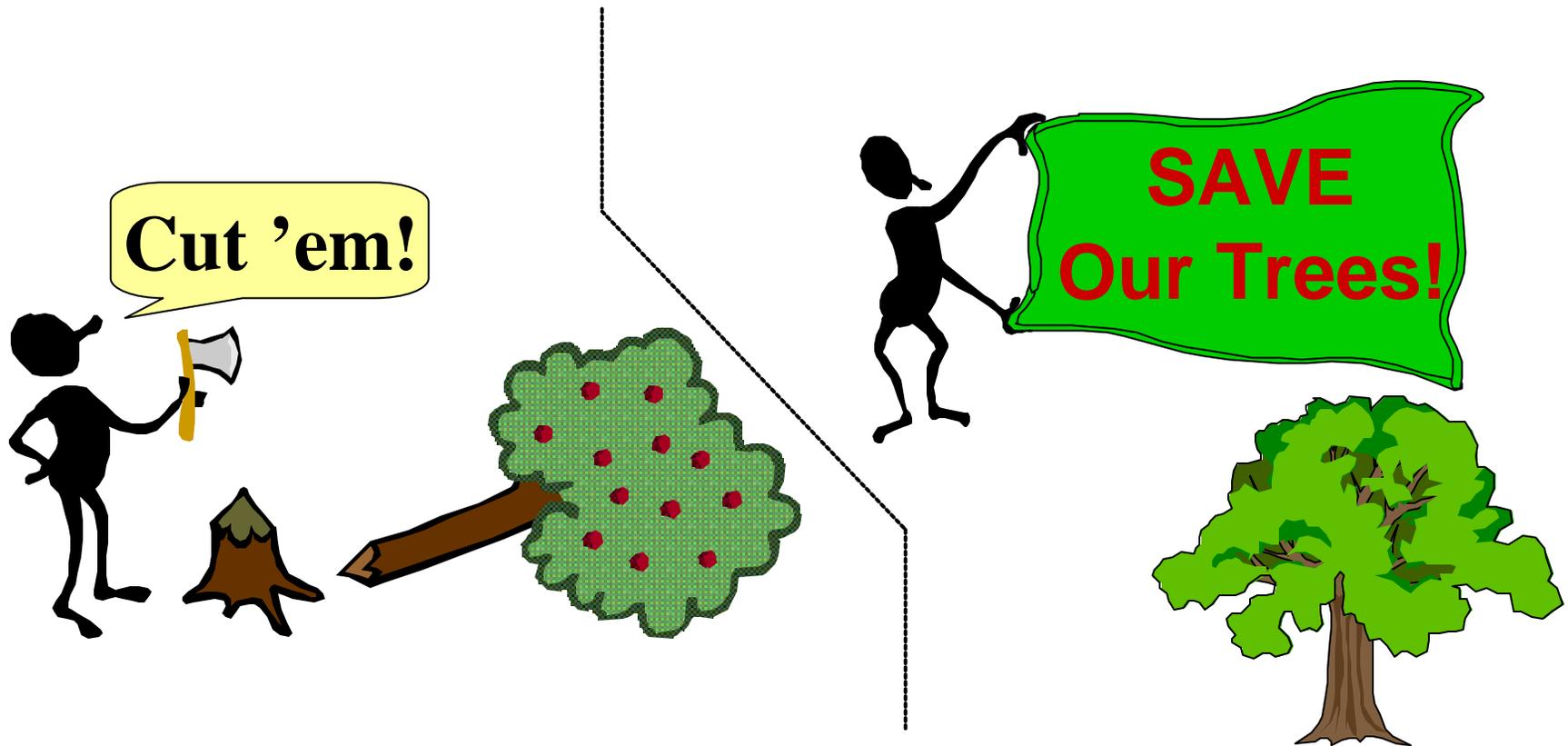
Problem Exploration: The missing decision element



Exploration leads to understanding.



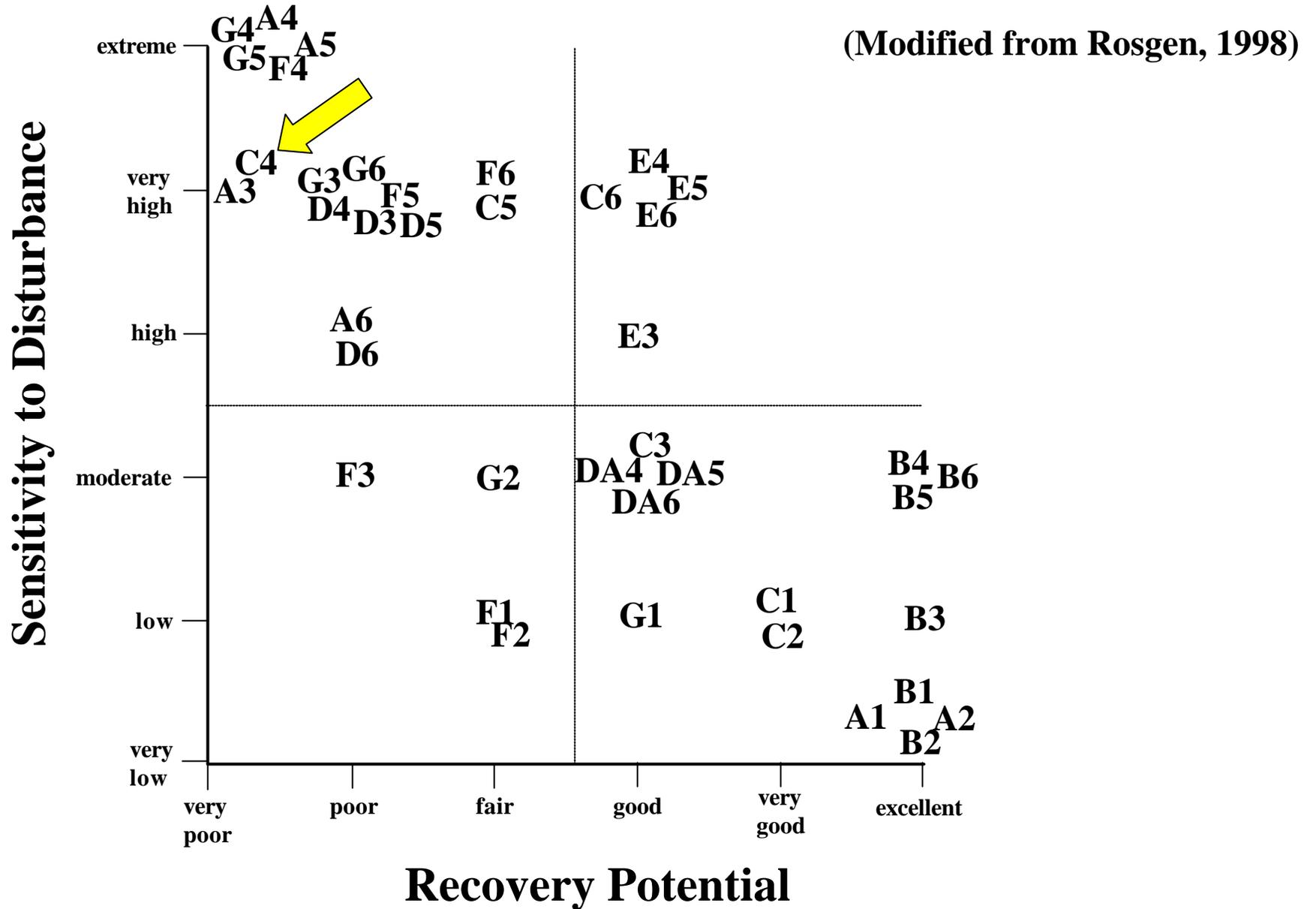
Let's "explore" how a river and associated salmon habitat might be affected by logging operations in its upper watershed.



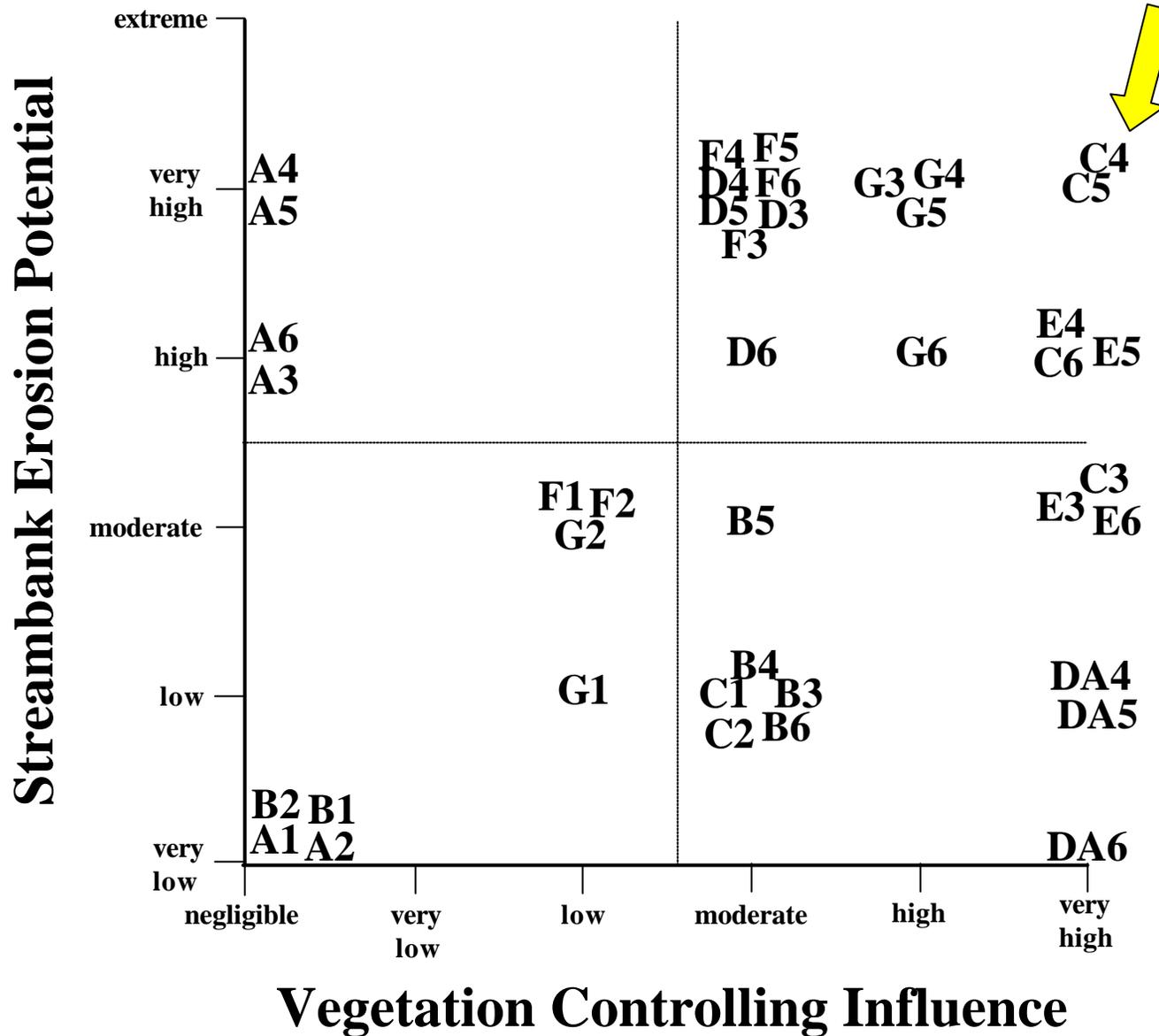


	Single -Threaded Channels										Multiple Channels								
Entrenchment Ratio	Entrenched (< 1.4)					Moderately Entrenched (1.4 - 2.2)			Slightly Entrenched (> 2.2)										
Width/Depth Ratio	Low (<12)		Moderate to high (>12)			Moderate (>12)		Very Low (<12)	Moderate to High (>12)		Very High (>40)		Low (<40)						
Sinuosity	Low (<1.2)	Moderate (>1.2)	Moderate (>1.2)		Moderate (>1.2)		Very High (>1.5)	High (>1.2)		Low (<1.2)		Low-Hi (1.2-1.5)							
Stream Type	A		G		F		B			E		C			D		D _A		
Slope	slope	range	slope	range	slope	range	slope	range	slope	range	slope	range	slope	range	slope	range	slope		
Channel Material	>0.10	0.04-0.099	0.02-0.039	<0.02	0.02-0.039	<0.02	0.04-0.099	0.02-0.039	<0.02	0.02-0.039	<0.02	0.02-0.039	0.001-0.02	<0.001	0.02-0.039	0.001-0.02	<0.001	<0.005	
Bedrock	A1a+	A1	G1	G1c	F1b	F1	B1a	B1	B1c			C1b	C1	C1c					
Boulders	A2a+	A2	G2	G2c	F2b	F2	B2a	B2	B2c			C2b	C2	C2c					
Cobble	A3a+	A3	G3	G3c	F3b	F3	B3a	B3	B3c	E3b	E3	C3b	C3	C3c	D3b	D3			
Gravel	A4a+	A4	G4	G4c	F4b	F4	B4a	B4	B4c	E4b	E4	C4b	C4	C4c	D4b	D4	D4c	DA4	
Sand	A5a+	A5	G5	G5c	F5b	F5	B5a	B5	B5c	E5b	E5	C5b	C5	C5c	D5b	D5	D5c	DA5	
Silt/Clay	A6a+	A6	G6	G6c	F6b	F6	B6a	B6	B6c	E6b	E6	C6b	C6	C6c	D6b	D6	D6c	DA6	

(From Rosgen, 1998)



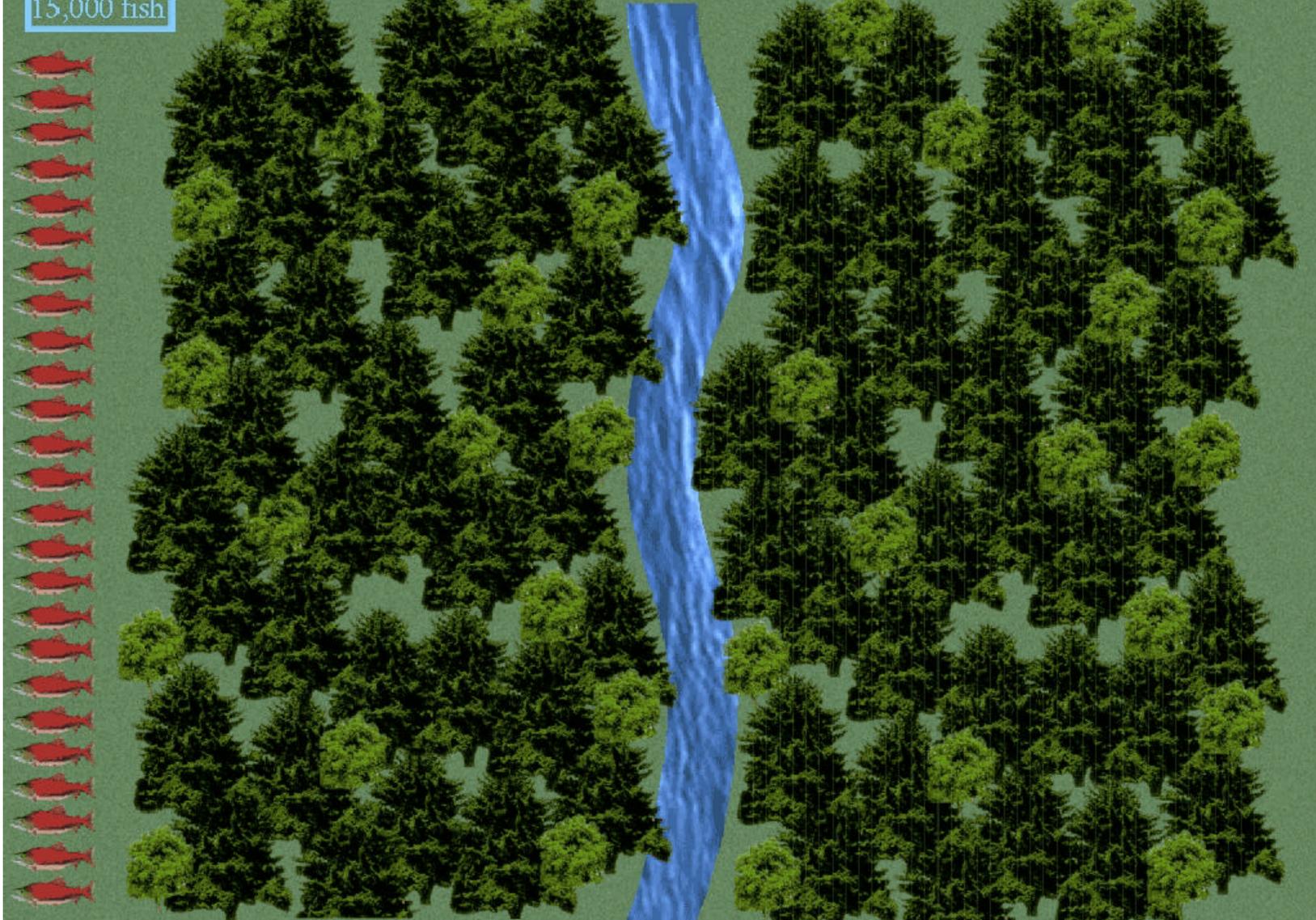
(Modified from Rosgen, 1998)



Ida

15,000 fish

"A stream of narrow portion backed by miles of heavily timbered soil..."



RESULTS

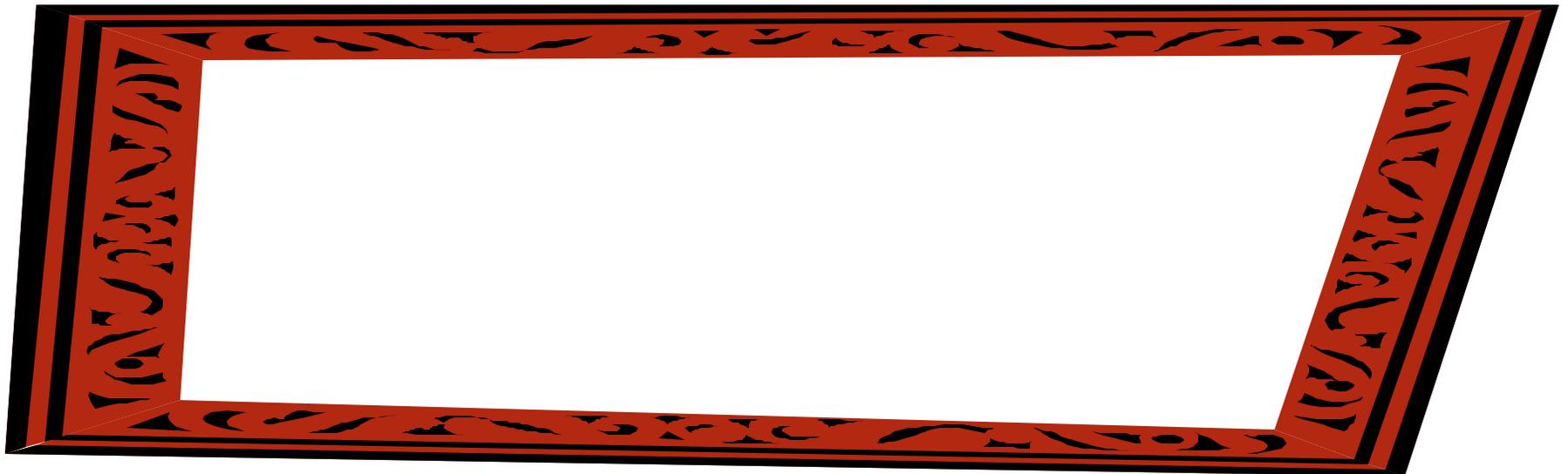


Good Decisional Processes & Frameworks should ...

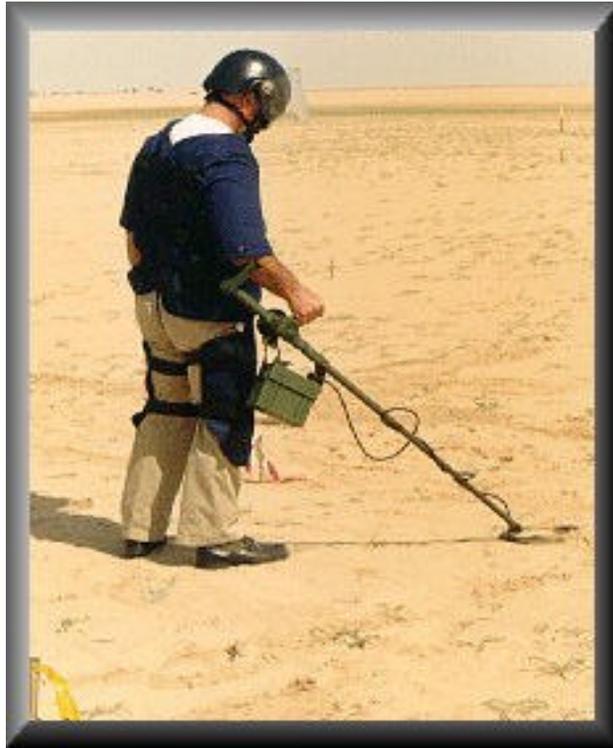
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Framing

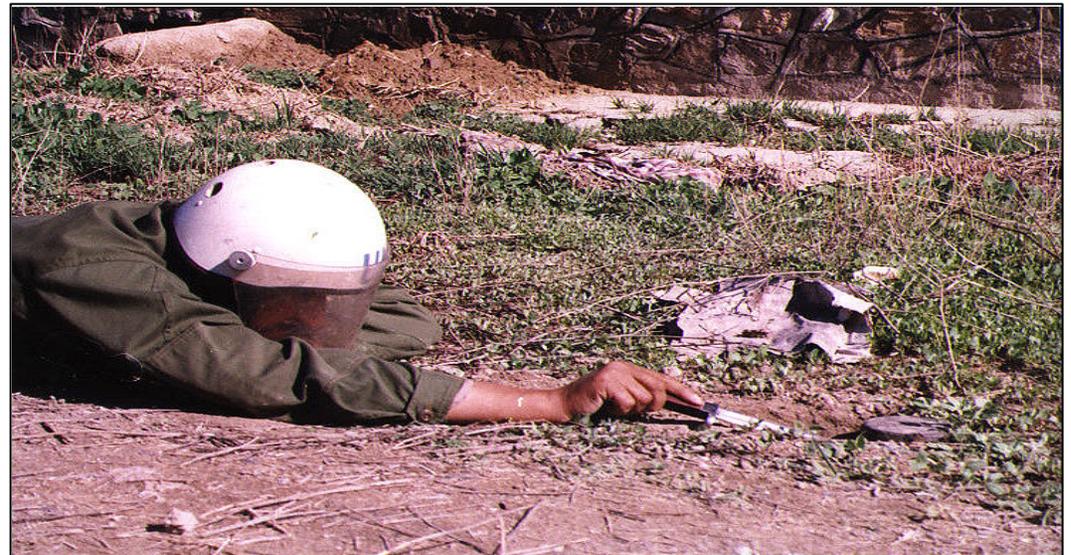
- **The way in which a problem is posed - that is, the “frame” in which a problem is presented.**
- **Wider the framing, greater the number of potential solution options (e.g., greater the creativity).**
- **Inclusiveness frequently enhances framing.**



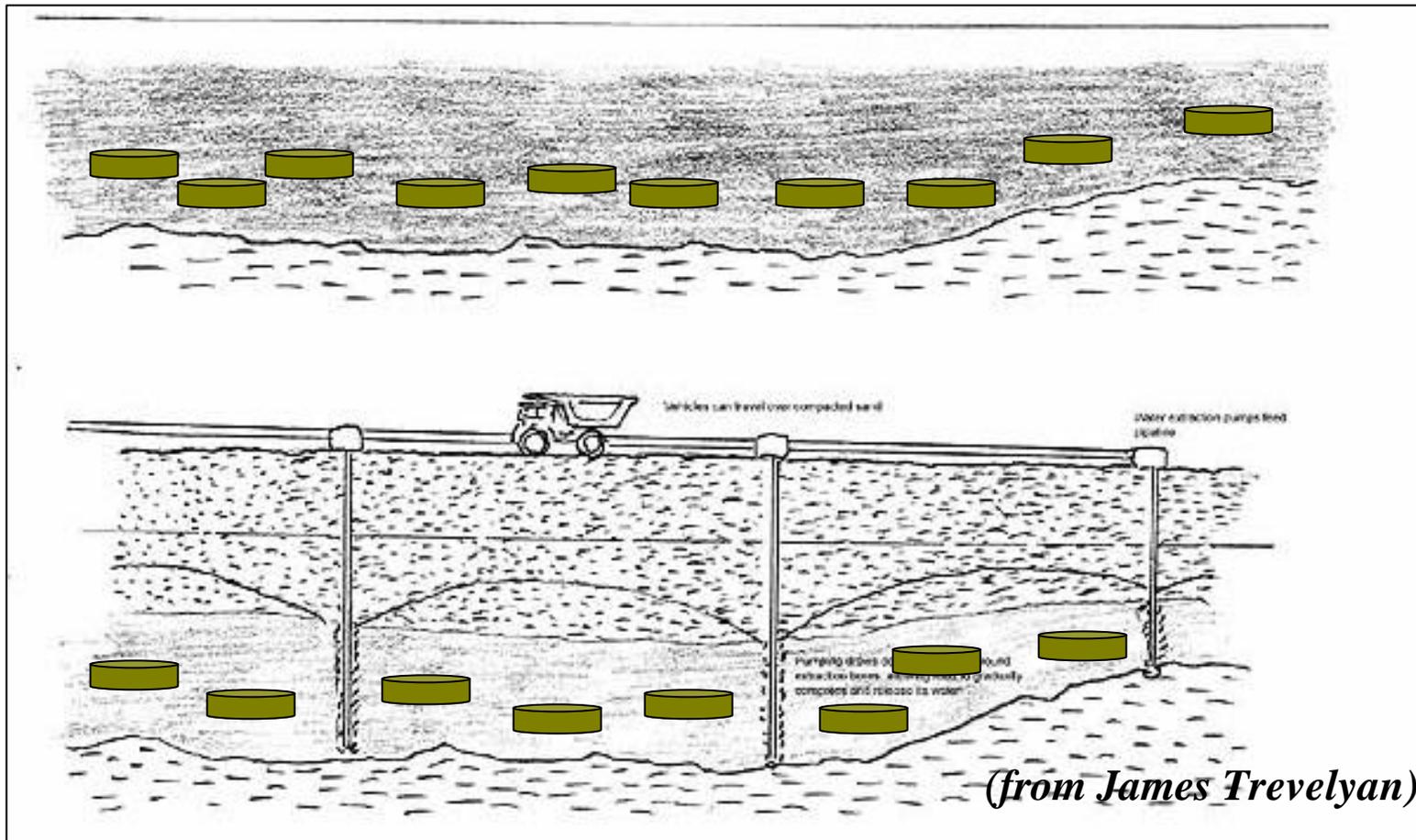
Old Paradigm: Clear landmines.



*The current methods for
mine clearance are essentially
unchanged since the 1940's ...
-- James Trevelyan*



New Paradigm: Prevent unwanted interactions between landmines and people.



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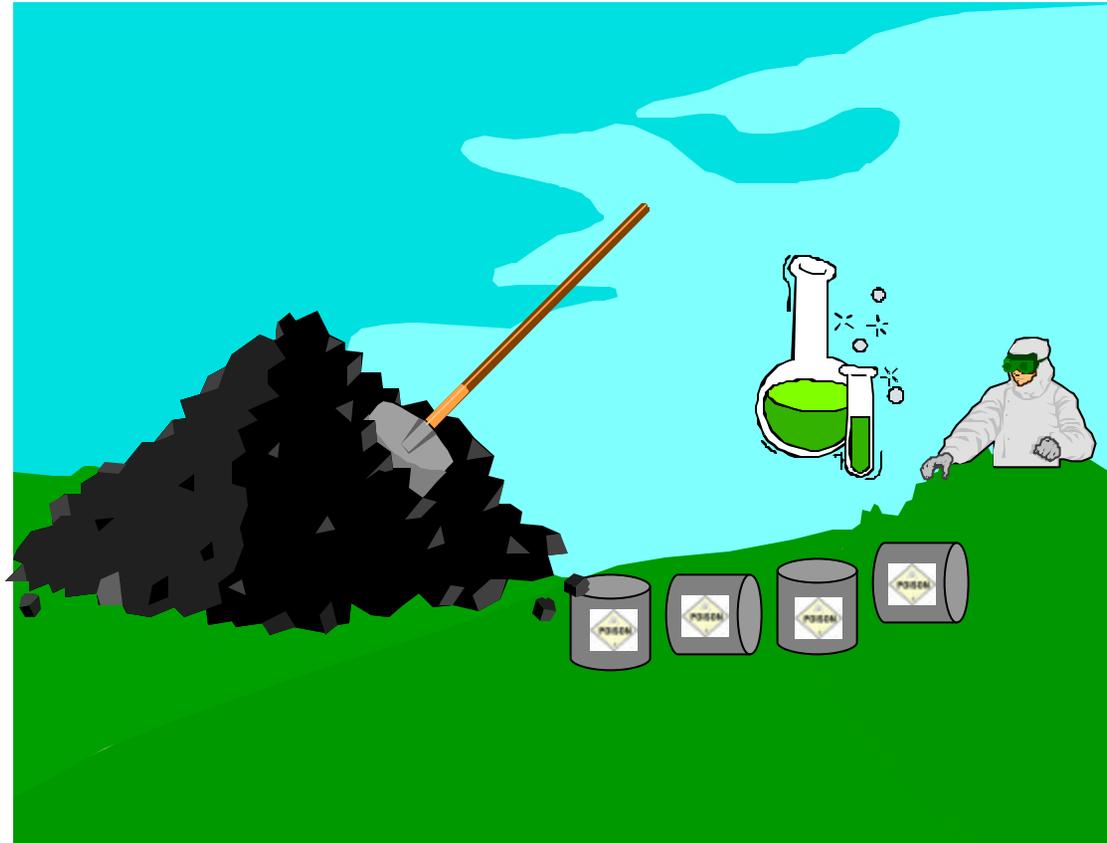
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Why -- because given enough time, stuff happens.

***Our story begins some 90 years ago
just before World War I***



Area used as an Army Chemical Weapons Research & Test Site from 1917 - 1920



Not known if warnings/records left behind



With time, “mother nature” reclaims area and any controls, if present, are lost



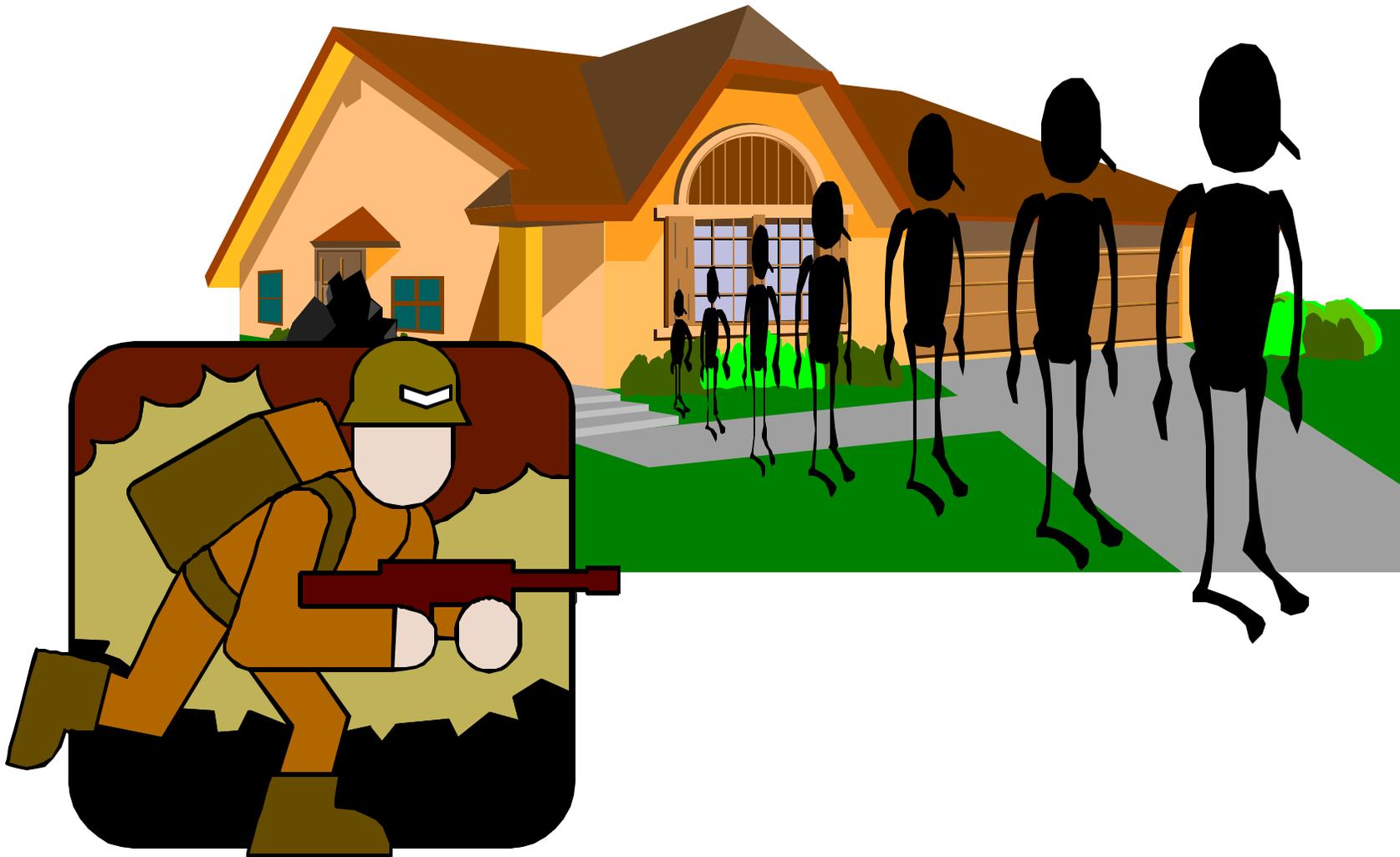
Fast Forward: *Trees are cut, roads are paved, and really nice homes are built.*



Then in 1993, hazard “rediscovered”



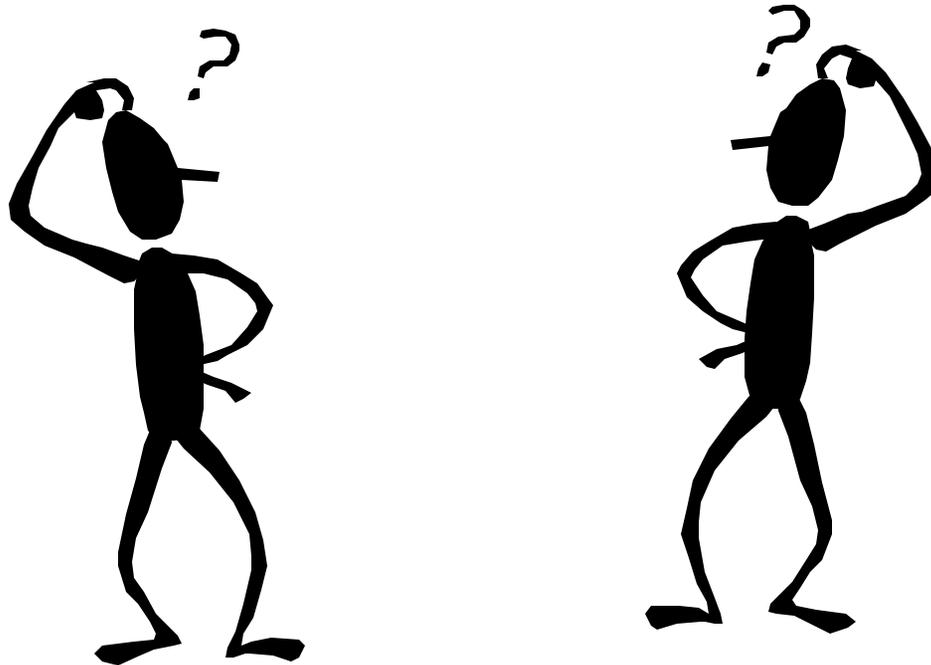
Army evacuates residents



Total price tag and impact still unknown



Our Challenge: How do we prevent similar stories being told some 100 years from now?



Starts with developing good decision processes that ...

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***Stewardship is the
responsibility of all of
us - providing us with
an opportunity to leave
a legacy for our
children and
grandchildren that is
greater than the one
we inherited.***

*From U.S. Department of the Interior, Partners in
Stewardship, 1999 Performance Report.*