

Science can't tell me what to do

The limitations of science and the
necessity of emotion in decision-making

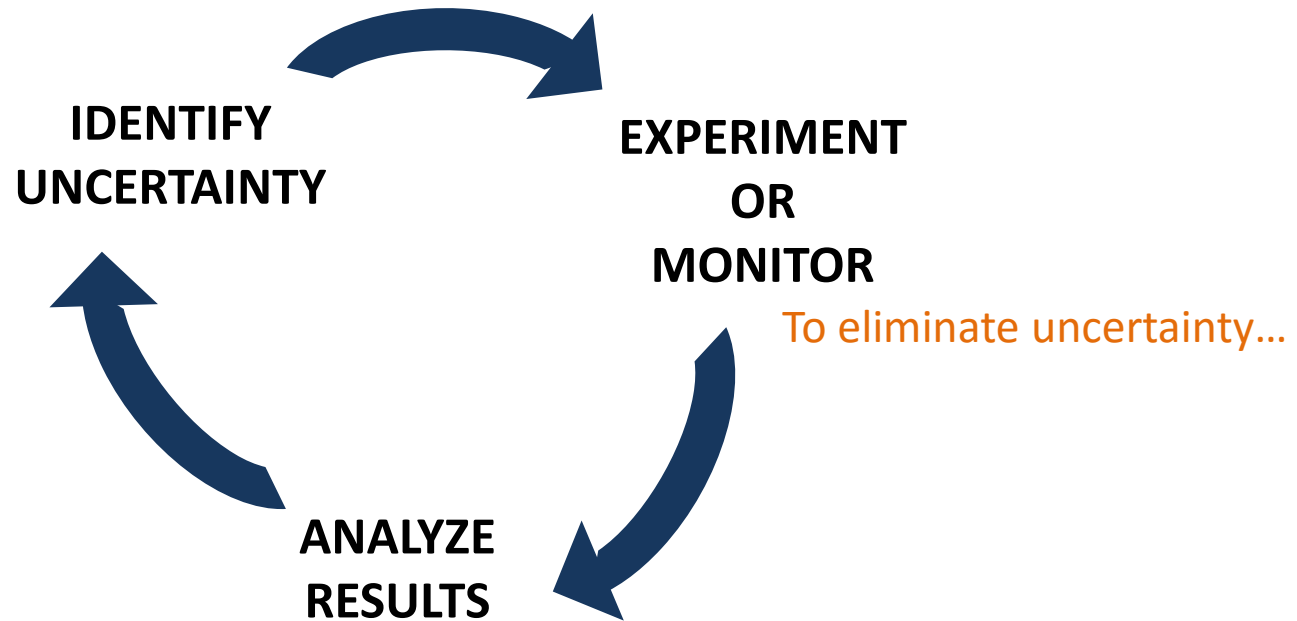
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The Problem:



The Problem:

A misunderstanding of the place of science in decision-making.

Why is this a problem?

Part one: A tale of two cognitive processes

Emotion

- Type 1
- System 1 (various psychologists: Kahneman, Tverskey)
- Id (Freud)
- Intuition (Gary Klein)
- Impulse
- Simultaneous processing (Laurance Gonzales)

JT MacCurdy: "Psychology recognizes that there are two great divisions...in human mental life... The conscious [logical] mind of intelligence and the unconscious illogical mind of instinct or emotion."

Logic

- Type 2
- System 2
- Super-ego
- Reason
- Science!!!
- Sequential processing

Things to know...

Emotion

- Mostly subconscious running in the background
- Always on A sneaky bugger. In the absence of other input, System 1 will give you answers whether or not they are correct. Will substitute easy questions for hard questions. Like a politician.
- Fast (At the speed of neurons.)
- Powerful
- Can be wrong
- Necessary for action

Logic

- Conscious
- Must be activated (Is lazy)
- Slow (Think dissertation.....)
- Powerful
 - Can be wrong
 - Not necessary for action



Radiolab story

What can they do for us?

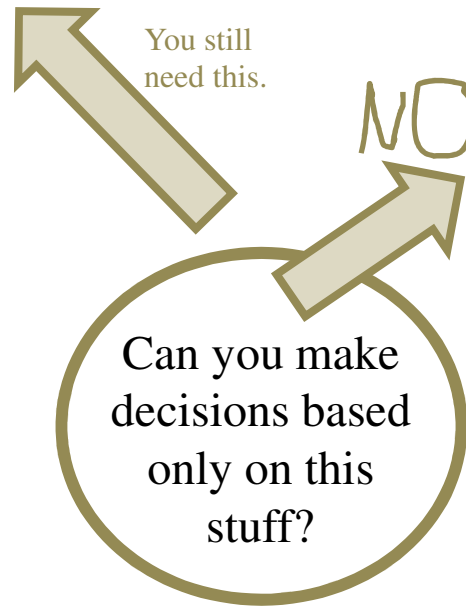
Emotion

- Assign value, costs
- Prioritize
- Interpret results (ie. Find meaning.)
- Help deal with ever-present uncertainty
- Assess risk tolerance
- Motivate!!!



Logic

- Provide
 - Information (factual)
 - Evidence
 - Probabilities
 - Correlations
 - Repeatability
 - Objectivity
 - Accountability

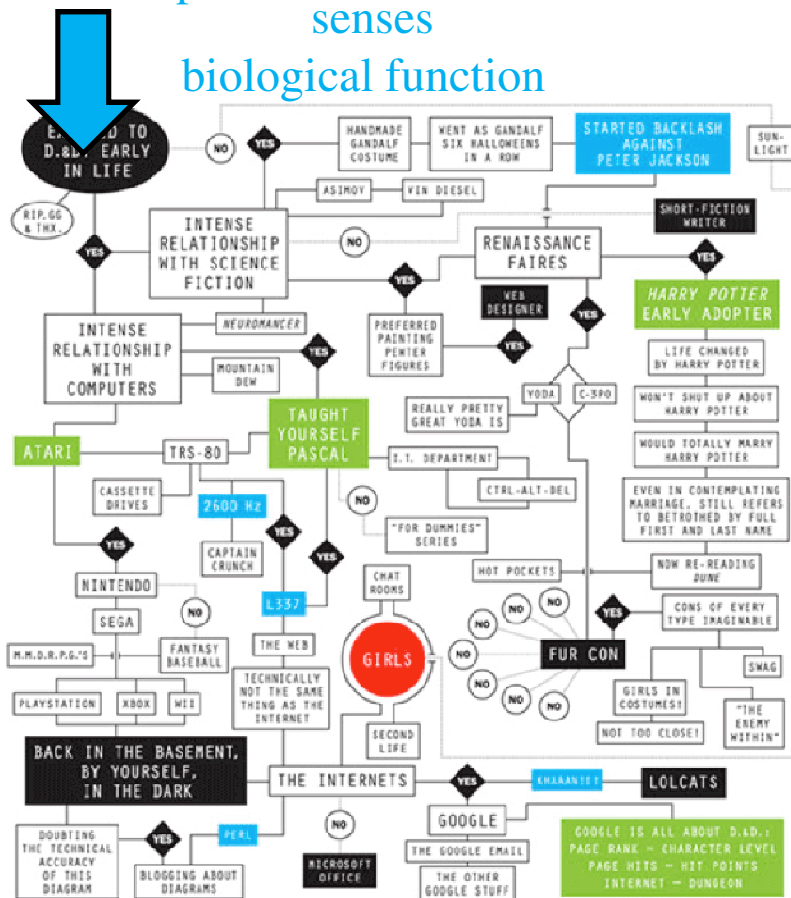


How do they work?

Emotion

memories evolved intuition
experiences senses

biological function



Logic

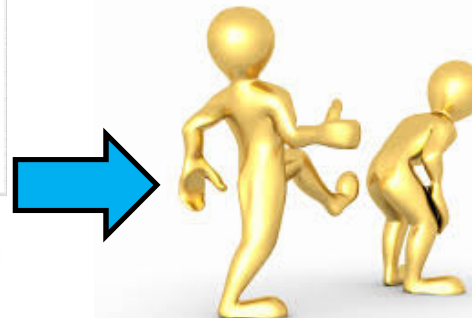
- We know...

It's conscious. Dummy.

If A, then B

If B, then D

If D, then Q...



What can they do for us?

Emotion

- Provide
 - Information (factual)
 - Evidence
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~~NOT~~ Logic

- Assign value, costs
- Prioritize
- Interpret results (find meaning)
- Help deal with ever-present uncertainty
- Assess risk tolerance
- Motivate
- Stimulate action

Which system to use?

(Trick question...)

Emotion

- Can be wrong
- Algorithms, Meehl
- More accurate than professional judgment, when uncertainty is high
- Moneyball, scouts
- Experts consider too many factors
- Hoffer : “The great simplifiers are the great scientists.”
- Ockham’s razor
- Congnative biases
 - Confirmation bias
 - Sunk-cost fallacy
 - Bias against loss due to action



Logic

- You can’t act.
- Paralyzed by uncertainty
 - Paralysis by analysis
 - Paralyzed by meaningless uncertainty.
 - Not everything is relevant
- Trap of statistical significance vs. functional significance
 - Tree farm example

Can you ^{consistently} make decisions only with:
^{good}

Emotion?

~~YES~~

Logic?

NO

Can you ^{consistently} make decisions?
^{How} ^{good}

Emotion

Logic

Part two: How to consistently make good management decisions

Emotion



Logic



Part two: How to consistently make good management decisions

Emotion + Logic = Rationality

Kahneman: “A rational person is “engaged.” Lazy thinking is a flaw of rationality.”

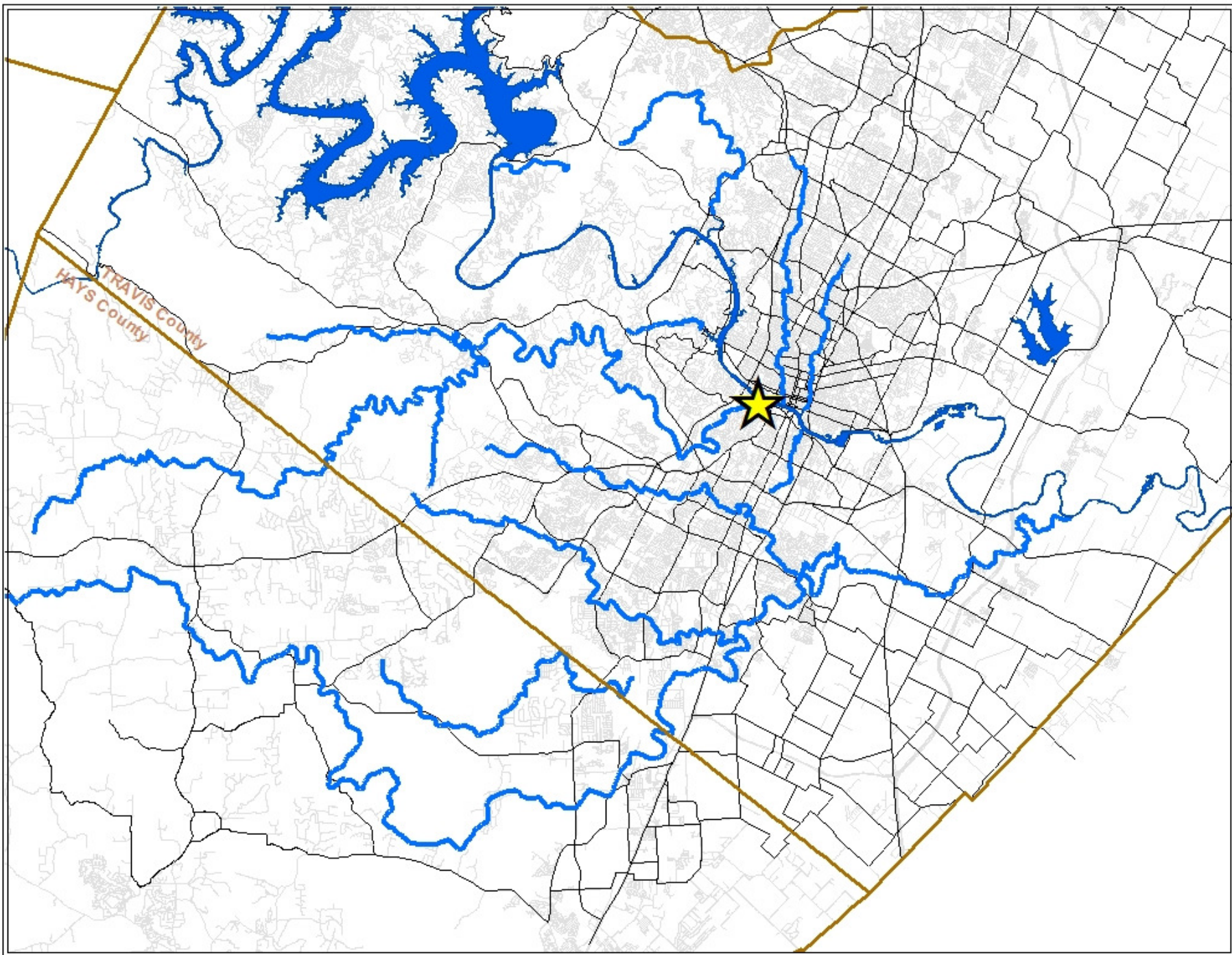
- Bring System 1 into the conscious realm.
- Be Introspective.
- Be engaged.
- Bring the two into agreement.

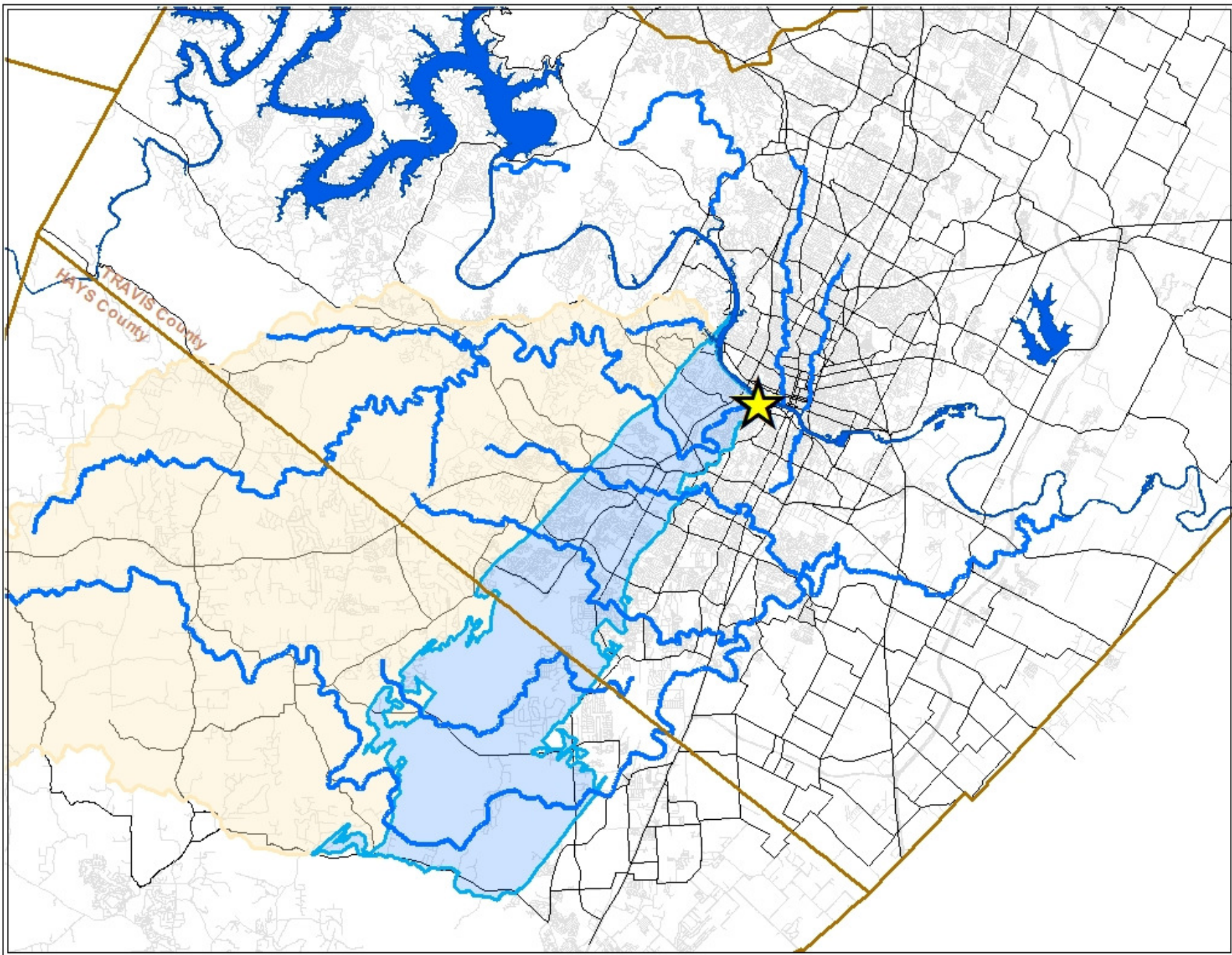
Biases may be at work or the logic could be flawed.

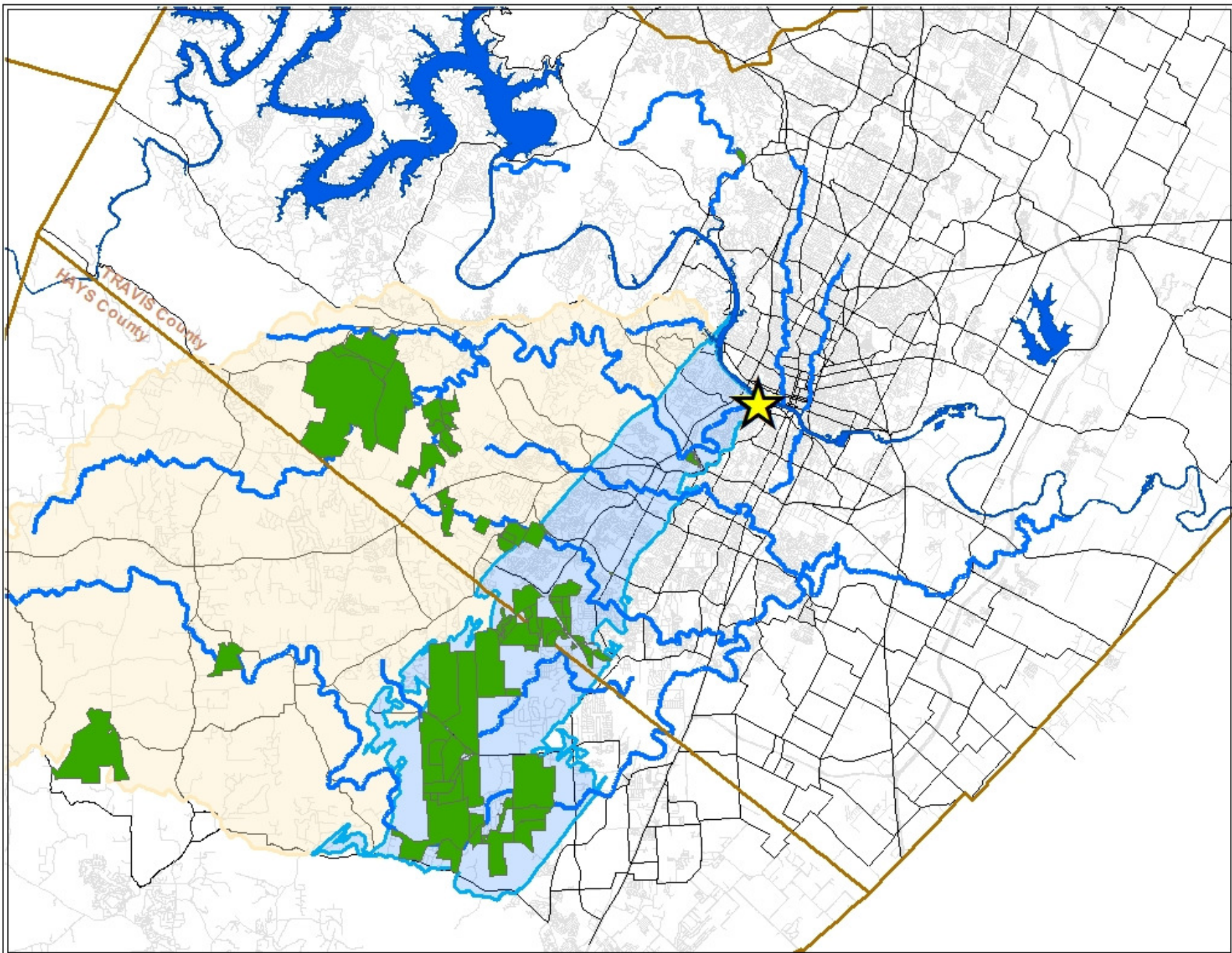
Part two: How to consistently make good management decisions

Examples from WQPL

- Science led Intuition: Source of Barton Springs water
- Emotion & Intuition led science: Mixed brush treatment









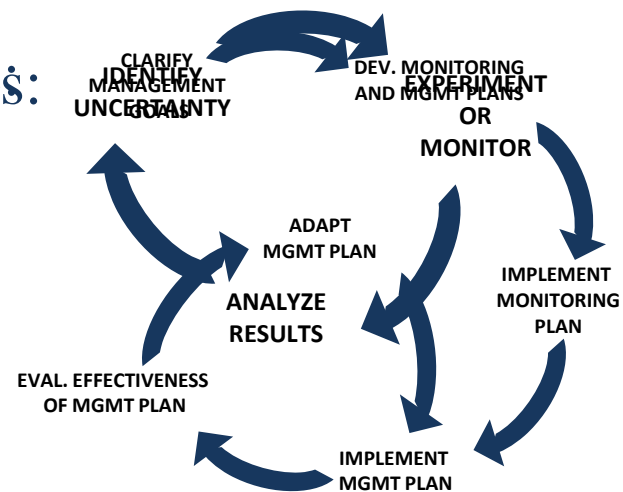




Part three: Practical recommendations for managers

- Actively assess the science as well as your professional judgment, understanding, and emotional motivations.
 - Make them congruent.
- Focus on what you know. You know more than you think.
- Nature is not fragile. You're probably not going to make things worse.
- Manage adaptively.
- Recognize that inaction is a choice. Inaction is action.
- Realize that systems will drift and you need to steer.

Intention:



Eric Hoffer:

“We know that words cannot move mountains, but they can move the multitude; and men are more ready to fight and die for a word than for anything else. Words shape thought, stir feeling, and beget action; they kill and revive, corrupt and cure. The “men of words” – priests, prophets, intellectuals – have played a more decisive role in history than military leaders, statesman, and businessmen...

“Man does not plunge into the unknown in search of the prosaic and matter-of-fact. His soul has to be stretched by a reaching out for the fabulous and unprecedented. He needs the nurse of magic...to lure him on and sustain him in his faltering first steps. Even modern science and technology were not in the beginning...sober pursuit[s] of facts and knowledge. Here, too, the magicians...were the pioneers. The early chemists looked not for prosaic acids and salts but for the...elixir of life. The early astronomers and discoverers... Columbus went looking not only for gold and fabulous empires but also for the Garden of Eden.