

# Creating Climate-Informed NCCPs/HCPs

Dan Cox, USFWS

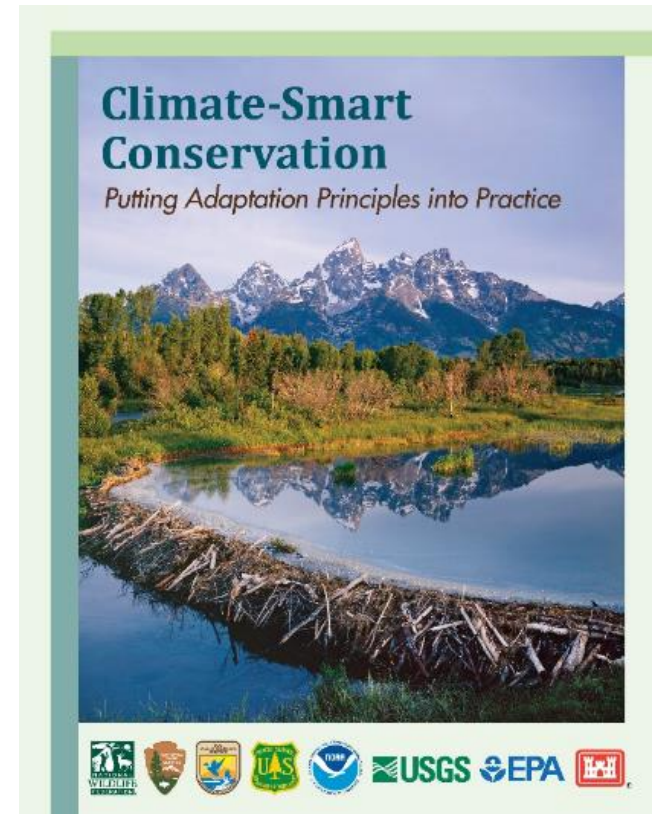
Jennie Hoffman, Adaptation/Insight



# Integrating climate change into conservation

## Climate smart principles

- Be intentional and explicit about linking actions to impacts
- Manage for change, not just persistence
- Reconsider goals, not just strategies
- Integrate adaptation into existing work

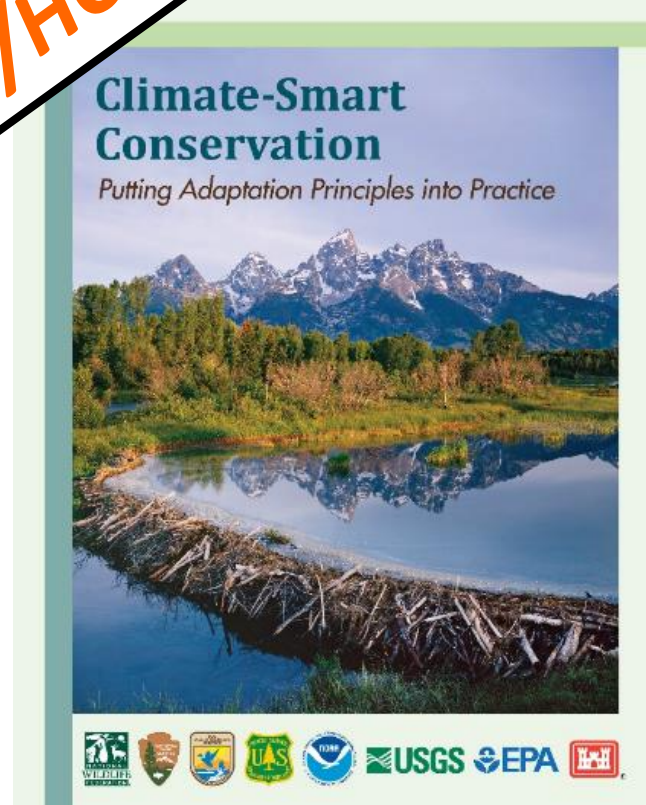


# Integrating climate change into conservation

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- Manage for change, not just conservation
- Reconsider goals, not just strategies
- Integrate adaptation with existing work

**How to apply this to NCCPs/HCCPs?**



“Don’t ask me what I want, ask me what I do.”

*-Mary Altalo*

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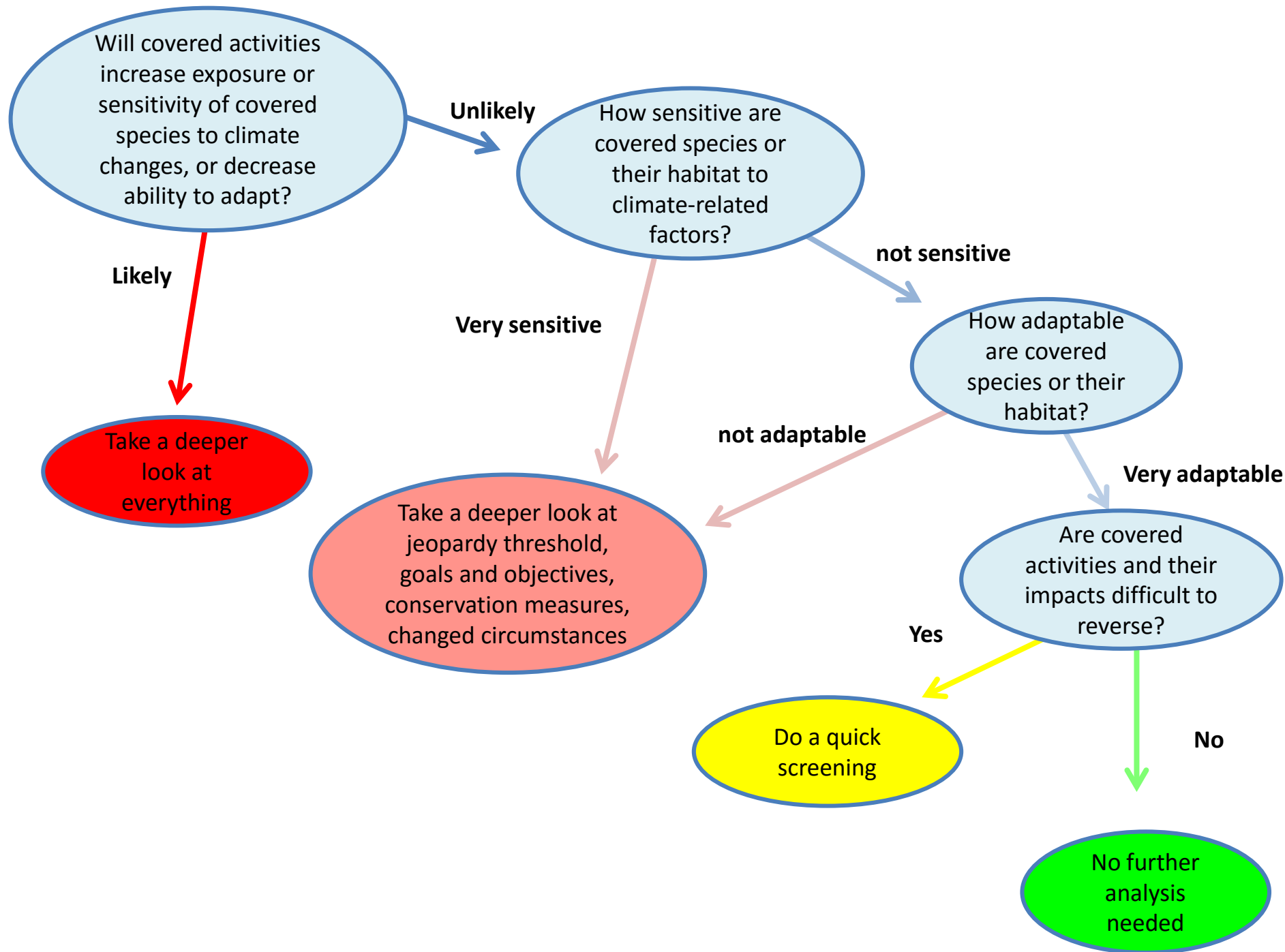
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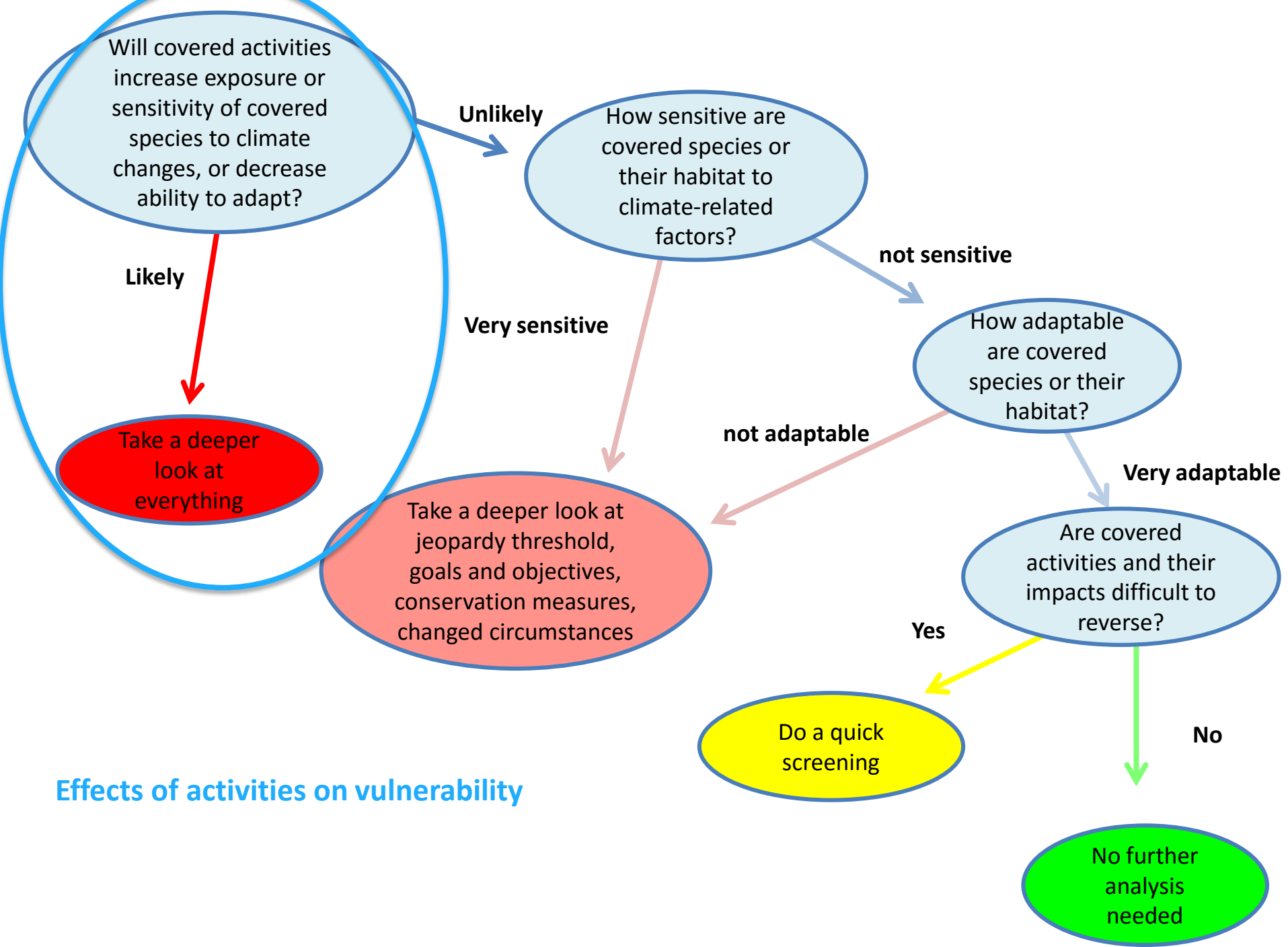
To create an NCCP/HCP, you:

- **Gather information** (*regulatory setting, environmental baseline*)
- **Do scientific analysis** (*take, impact of taking, effects of avoidance, minimization, and mitigation measures*)
- **Make decisions** (*risk management, tradeoffs, practicability, construction of alternatives*)

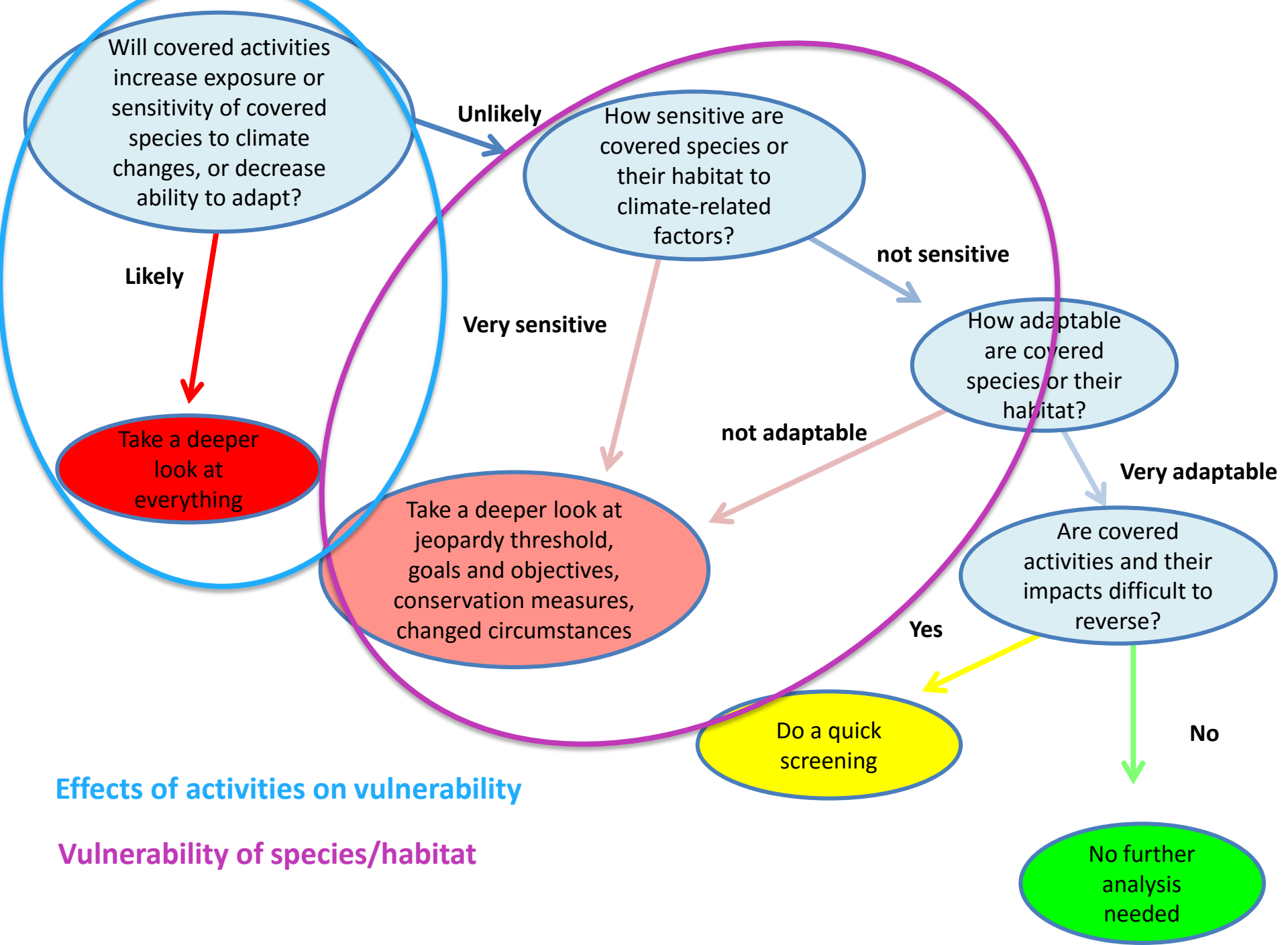
# Integrating climate change into HCPS

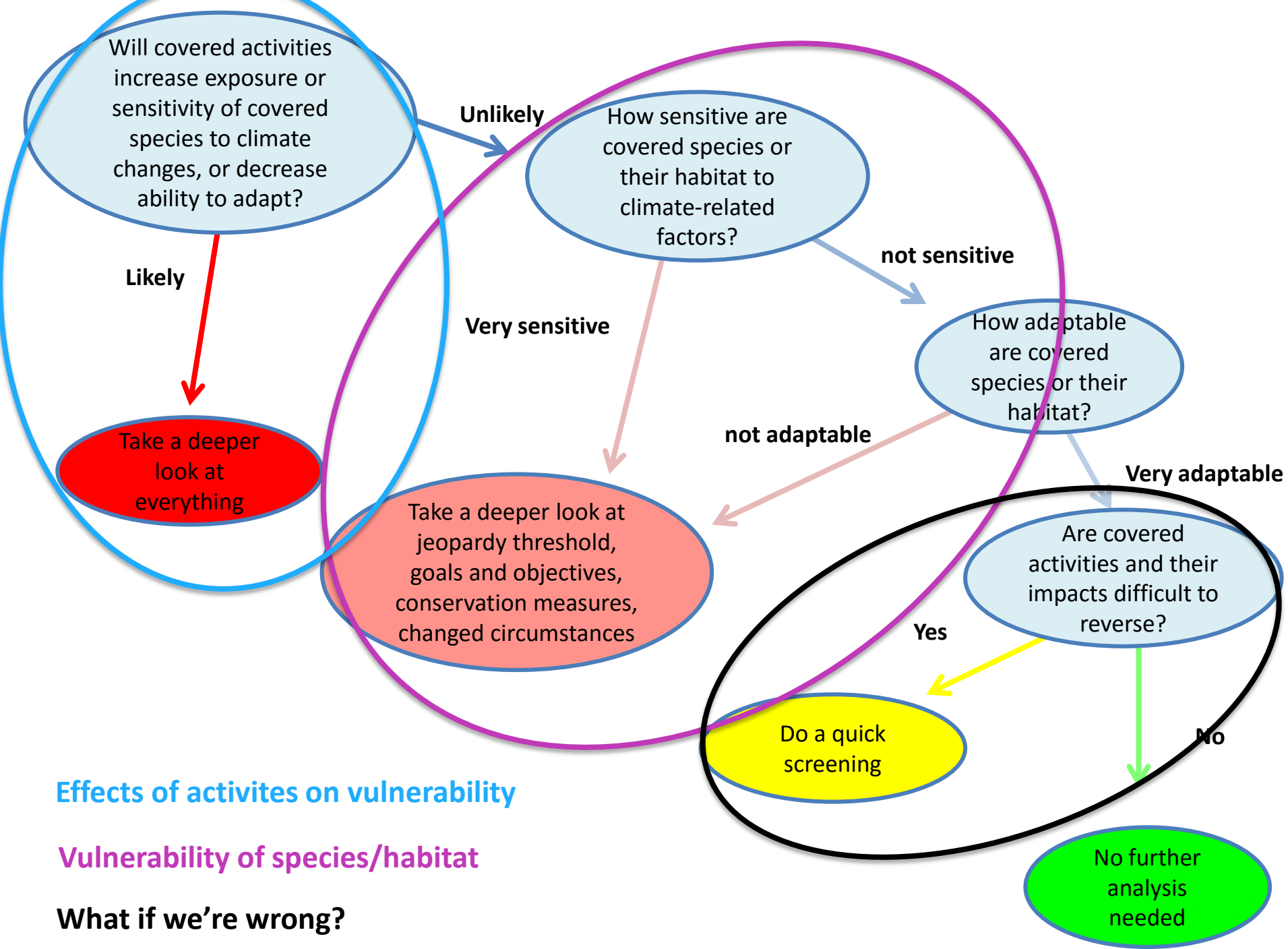
- “Ask the climate questions” during scoping phase

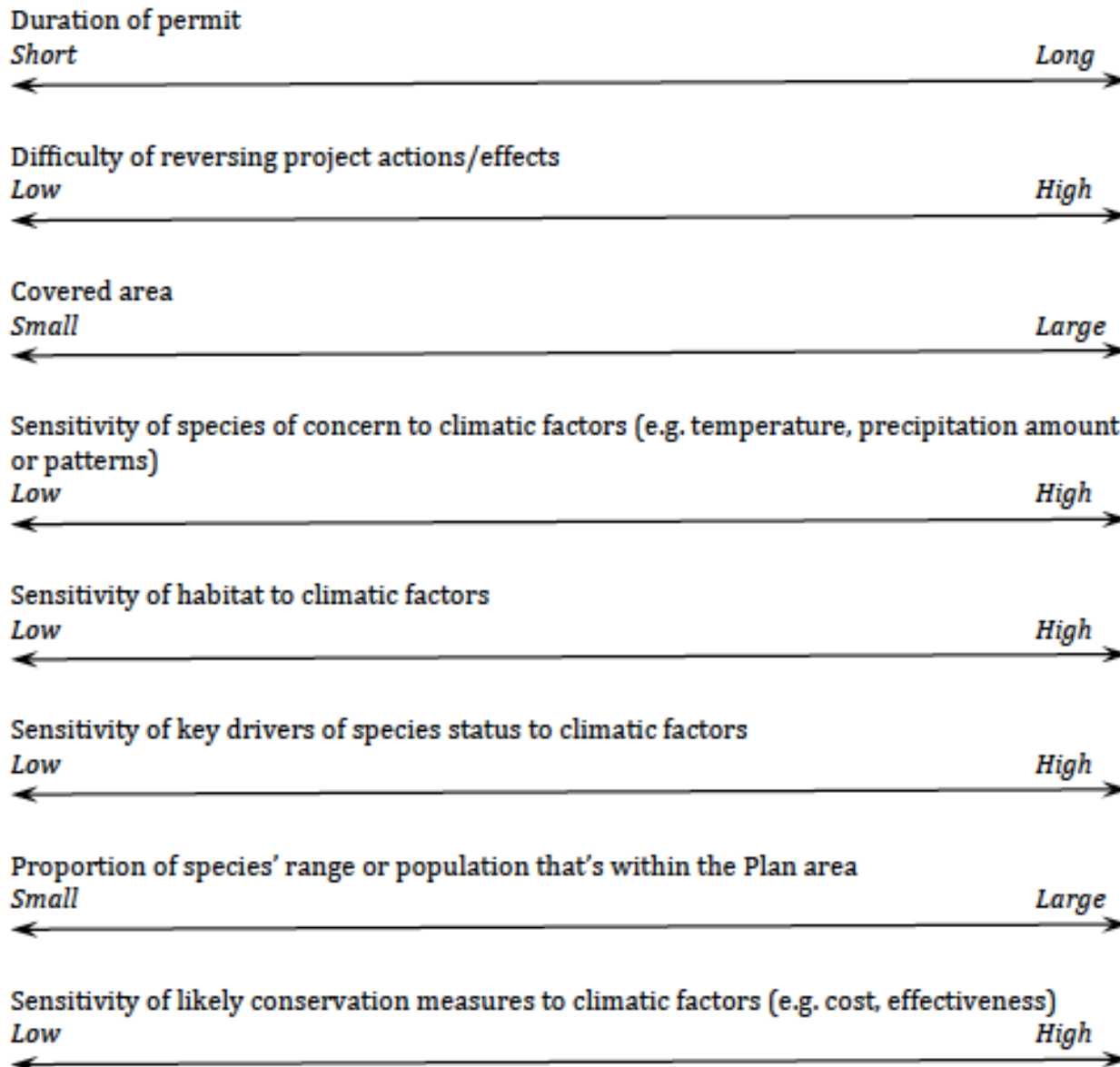












# Integrating climate change into HCPS

- “Ask the climate questions” during scoping phase
- If appropriate, do further climate risk/vulnerability assessment

# Climate impacts and implications by HCP section

	Climatic changes and effects						
Implications for each HCP section (consider feasibility and effectiveness)	Precipitation <i>Intensity, seasonality, type, max, min</i>	Air temperature <i>Max./min, night/day, seasonality</i>	Drought <i>Intensity, frequency, duration</i>	Flood <i>Intensity, frequency, duration</i>	Fire <i>Frequency, size, intensity, timing</i>	Seasonality <i>Earlier spring, later fall, longer growing season, etc.</i>	Water quality and quantity <i>Lower DO, temperature</i>
Covered area							
Covered species							

	What climate-related factors matter for this	What could happen in response to	How easily could species, habitats, or mitigation measures be adjusted in the short term?	How easily could the species, habitat, or mitigation measure adjust to the adjusted for changes in the long term?	How could covered activities affect the sensitivity or adaptive capacity of species, habitats, or mitigation measures?
State of threat					
State of threat					

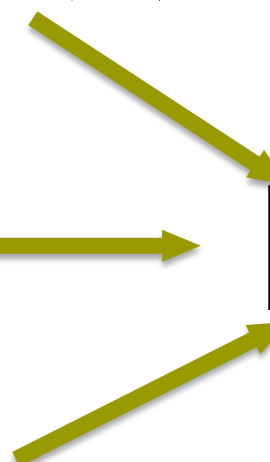
## Sensitivity, adaptive capacity of species, habitats, activities

	Climate considerations	Options for addressing
BCOs		
Covered lands		
Duration		
Covered species		
Covered activities		
Resource management		
Monitoring		
Changed and unforeseen		
Alternatives		

## Key considerations and options

	Ecological implications			
Climatic changes and effects	Potential HCP-relevant effects on natural systems (species, habitat, biotic interactions)?	Potential HCP-relevant effects on human systems (behavior, economics, and policy)?	Possible landscape scale effects that could affect species and systems within the HCP area?	HCP sections that could be influenced by any of the changes or effects? How?
Longer, more frequent, more intense droughts				
Decreasing snowpack				
Longer frost-				

## Climate Impacts and ecological implications



# Worksheet 1a:

## Sensitivity & Adaptive Capacity of Species, Habitats, and Activities

		What climate-related factors matter for this species, habitat, or conservation measures?	What could happen in response to changes? Think about both thresholds and gradual changes	How easily could species, habitats, or mitigation measures adjust to/be adjusted for changes in the near term? <sup>1</sup> What would it take?	How easily could the species, habitat, or mitigation measure adjust to/be adjusted for changes in the long term? <sup>2</sup>	How could covered activities affect the sensitivity or adaptive capacity of species, habitats, or mitigation measures?
Species of interest	<i>Salmon</i>	<i>Water temp, precip/snowmelt, overall water availability</i>	<i>Disease, death, inability to reach spawning grounds</i>	<i>Generally high fecundity supports recovery from a few bad years.</i>	<i>Evolution of thermotolerance is possible but limits aren't known.</i>	<i>Culverts could limit connectivity if they're not designed for future conditions</i>

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**Sensitivity**

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**Sensitivity**

**Ability to adapt**



# Worksheet 1b:

## Climate Impacts and ecological implications

	Ecological implications			
Climatic changes and effects	Potential HCP-relevant effects on natural systems (species, habitat, biotic interactions)?	Potential HCP-relevant effects on human systems (behavior, economics, and policy)?	Possible landscape scale effects that could affect species and systems within the HCP area?	HCP sections that could be influenced by any of the changes or effects? How?
Longer, more frequent, more intense droughts				

# Worksheet 1c:

## Climate impacts and implications by HCP section

		Climatic changes and effects						
<b>Implications for each HCP section</b> <i>(consider feasibility and effectiveness)</i>		<b>Precipitation</b> <i>Intensity, seasonality, type, max, min</i>	<b>Air temperature</b> <i>Max./min, night/day, seasonality</i>	<b>Drought</b> <i>Intensity, frequency, duration</i>	<b>Flood</b> <i>Intensity, frequency, duration</i>	<b>Fire</b> <i>Frequency, size, intensity, timing</i>	<b>Seasonality</b> <i>Earlier spring, later fall, longer growing season, etc.</i>	<b>Water quality and quantity</b> <i>Lower DO, temperature</i>
Covered area								
		Biological effects of climatic changes						
<b>Implications for each HCP section</b>		<b>Species</b> <i>Changes in diet, range, behavior, migration timing</i>	<b>Diseases or parasites</b> <i>New diseases, range shift, changes in virulence and transmission</i>	<b>Competitive interactions</b> <i>E.g. Changes in interaction strength, spread of non-native species, changes in population numbers of key predator or prey species or symbiotic partners</i>		<b>Human behavior or policy responses</b> <i>that could affect take, impacts, cost, or effectiveness of mitigation measures and ongoing management, e.g. changes to water pricing and permits</i>		
Covered area								
Covered species								

# Worksheet 2:

## Bringing it all together

	<b>Key climate considerations</b> <i>Hypothetical examples in italics</i>	<b>Options for addressing</b> <i>Hypothetical examples in italics</i>
Covered area	<i>Do covered area account boundaries account for possible changes in species' ranges due to climatic changes and variability?</i>	<i>Adjust covered area boundaries to accommodate range shifts using either a generic safety factor or modeled range changes.</i>
Covered species	<i>Will climatic changes or effects increase the risk to the species sufficiently that allowing any incidental take is no longer prudent?</i>	<i>Make sure population projections include potential climate impacts.</i>
	<i>Given climate-related decreases in ground- and</i>	<i>Set clear and sufficiently protective thresholds for limiting or</i>

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*We've also created an annotated HCP template*

# Guidance on specific issues

- Choosing and using climate information
- Choosing and using species distribution models
- Climate-informed reserve design

*Special thanks to people who reviewed and discussed the guides!*

# Examples

- Changed and Unforeseen Circumstances
  - Specific changes of concern
    - Fowler Ridge, Hays County
  - “Safety margin”
    - Santa Clara Valley, Fowler Ridge
- Costs and funding
  - Santa Clara Valley
- Mitigation measures
  - Coachella Valley
  - Relevant non-HCP examples

*Special thanks to Sara Moore for helping to review and score HCPs!*

# All this and more available on our website



## Climate informed HCPs

 Search this site

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- Climate information
- Species distribution models
- Reserve design
- Acknowledgements
- Examples

### Navigation

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  - Climate information
  - Examples
  - Making your HCP climate-smart
  - Questions?
  - Reserve design
  - Species distribution models
  - Start here
  - Worksheets

## Home

Welcome to the Climate-Informed HCP web site!

At a Climate Smart Conservation training a few years ago Dan Cox (USFWS) and Jennie Hoffman (Adaptation/Insight) got to talking about the need to step down the Climate Smart guidance for the HCP practitioners with whom Dan works. With some start-up funding from the North Pacific and Great Basin LCCs and some follow-on funding from USFWS Region 8 we created a series of "quick guides" and worksheets to help people integrate climate change into HCPs. We started with what HCP practitioners *do*, the decisions and analysis they make, and thought about how climate change might come into play.

- If you're just getting going, start with (no surprise) the "Start Here" page. It has a couple of graphics to help you figure out what level of climate change analysis is appropriate for a given HCP, along with an overview guide of what it means to do a climate-informed HCP.
- If you're ready to start your climate assessment, head to the "Worksheets" page under the "Start Here"
- If you're looking for overviews of specific topics—climate-informed reserve design or choosing and using climate information or species

# Next steps

- Depends on funding & interest, but maybe:
  - Climate-smart HCP workshops
  - Deeper dive into specific aspects of HCP
    - Mitigation ratios, mitigation banking
    - Adaptive management
    - Impact assessment
  - Refine web site



# Thanks!

<https://sites.google.com/site/climateinformedhcps/>

Questions? [jennie@adaptationinsight.com](mailto:jennie@adaptationinsight.com)

