

# FFRMS & Executive Order 13690

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# FFRMS & Executive Order 13690

## Today's Agenda



Photo: Varrella, 2009

1. Start With *WHY*?
2. History of Exec. Orders
3. New Components of FFRMS
4. Details of FFRMS
5. 8-Step Decision-Making
6. Colorado Perspectives
7. Group Dialogue

# FFRMS & Executive Order 13690



Photo: Varrella, 2013

## Start With *WHY?*



# Start With *WHY?*

## Disaster Zones

No sooner has severe weather ripped through a region, as a series of 305 tornadoes did the American South from Apr. 25-28, than the rush begins to announce estimates of the cost—in

going to go through a window, but we can look at claims data in the past and say on average for this level of winds this is the kind of insured losses that you will see."

Weather Service dis immediately after the damage on the day bad, as it was in Al-6, the Federal Emer-ent Agency will send determine if enough a caused to justify use of federal funds. So far in 2011, FEMA has made 24 such declarations—12 for winter storms, 8 for tornadoes.

None dispute the increased frequency of tornadoes: As of May, there have already been more destructive twisters in 2011 than typically occur in a year. Larsen and other catastrophic risk model-ers do, however, debate how much of

Source: Bloomberg Businessweek, 2011

### 2010 National Disaster Costs:

<b>Floods</b>	<b>=</b>	<b>\$5.1 Billion</b>	<b>(52%)</b>
<b>Tornado</b>	<b>=</b>	<b>\$1.1 Billion</b>	<b>(11%)</b>
<b>Hail</b>	<b>=</b>	<b>\$1.0 Billion</b>	<b>(10%)</b>
<b>Others</b>	<b>=</b>	<b>\$2.6 Billion</b>	<b>(27%)</b>
<b>TOTALS</b>	<b>=</b>	<b>\$9.8 Billion</b>	<b>(100%)</b>

**\$1b**  
Total losses from the April 2011 Alabama tornadoes may top the figure with insured losses reaching hundreds of millions of dollars.



### Tornado Alley

As of May 4, 21 teams from the National Weather Service had assessed damage from 178 tornadoes (of the 305) across the South last week—an historic record

Median per capita storm damage (all storm types) from 2001-2010 by state



Fatalities, injuries, and costs  
A 2010 survey  
FATALITY INJURIES  
TOTAL (MILLIONS)

HEAT	138: 602
FLASH FLOOD	67: 183
RIP CURRENT	64: 70
TORNADO	45: 699
RIVER FLOOD	36: 127
COLD	34: 1
LIGHTNING	29: 162
WINTER STORM	20: 33
HIGH WIND	18: 63
THUNDERSTORM	15: 305
FIRE WEATHER	1: 34
ICE	1: 1
HAIL	0: 42
DROUGHT	0: 0
TOTALS	489 fatalities, 2,362 injuries, \$9.837 billion cost

**MISSOURI**  
Apr. 22  
A tornado blew out windows and tore off a portion of the roof at the Lambert-St. Louis International Airport.

**NORTH CAROLINA**  
Apr. 16  
FEMA has approved \$2.8 million in grants for North Carolinians following a day of damaging winds.

**MISSISSIPPI**  
Mar. 9  
Seven to 9 inches of rain fell in some areas as a storm that caused tornadoes swept through Mississippi, Alabama, and the Florida peninsula.

**ILLINOIS**  
Feb. 2  
Over 20 inches of snow fell in Chicago by Feb. 2, disrupting travel throughout the U.S.

**NEW YORK**  
January  
A total of 30 inches of snow fell in Central Park, breaking the city record for the month.

NOTES: 2010-CUMULATIVE TORNADOES ARE BASED ON FEDERAL BUREAU OF INVESTIGATION REPORTS. STORM DAMAGES PER STATE COMPILED BY NATIONAL HAZARD CENTER. FATALITIES, INJURIES, AND COSTS ARE BASED ON FEDERAL BUREAU OF INVESTIGATION REPORTS. FATALITIES, INJURIES, AND COSTS ARE BASED ON FEDERAL BUREAU OF INVESTIGATION REPORTS. FATALITIES, INJURIES, AND COSTS ARE BASED ON FEDERAL BUREAU OF INVESTIGATION REPORTS.

# Start With *WHY?*

## Recent Considerations:

- Flood losses are increasing
  - Despite the NFIP
- **WARNING** Climate on the brain
  - Hot topic
- Natural & Beneficial FP functions better understood
  - And more frequently incorporated into planning, design and construction

Photo: Varrella, 2014

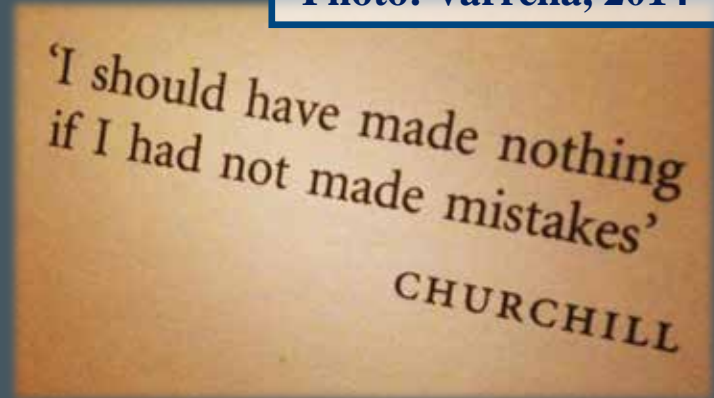


Photo:  
Varrella,  
2012





# FFRMS & Executive Order 13690

Photo: Varrella, 2012



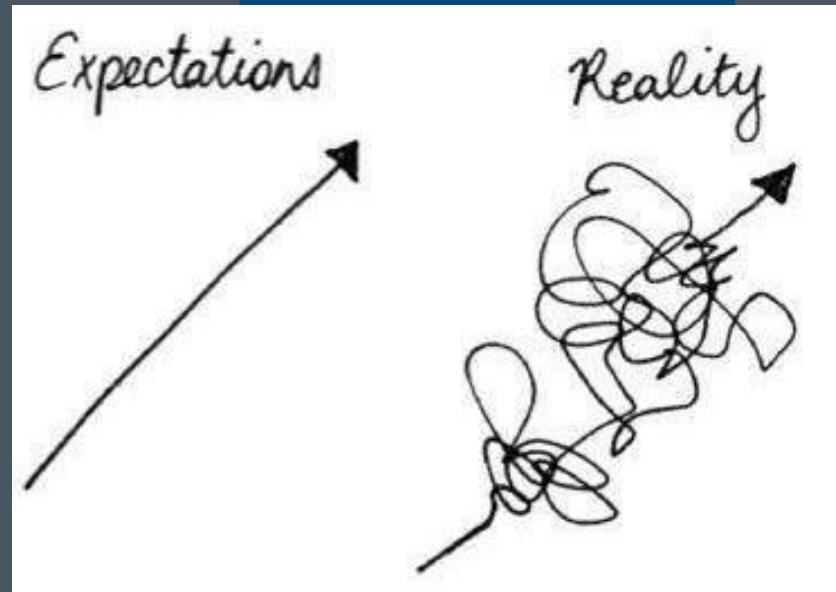
## History of Executive Orders

# History of Executive Orders

## Exec. Order 11988:

- Signed May 24, 1977 (Pres. Carter)
- Established a general policy
- Cites specific req's for Federal agencies
- **Goals**
  - Avoid adverse FP impacts
  - Avoid FP development
  - Losses from flooding affect national security

Doodle by Jessica Hagy,  
@JessicaHagy, 2014



# History of Executive Orders

Photo: Varrella, 2013

## Exec. Order 13690 DRAFT:

- Drafted Jan. 28, 2015 (Pres. Obama)
- Reaffirms EO 11988 tenants
- Additions for Fed. Agencies
  - Use a higher flood elevation
  - Expand the flood hazard area
  - Use climate change in planning
- Will be amended with comments
  - MitFLG = Mitigation Framework Leadership Group
- “***These guidelines are advisory***” – (L.193 & 217)
  - Agencies will draft rules & regs in 1 year (L.482)





# History of Executive Orders

## EO 13690 Definitions:

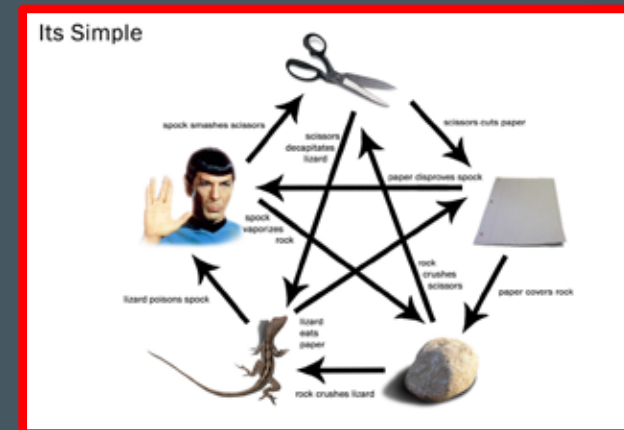
- Action = any Federal activity (*unchanged*)
- Structure = walled & roofed building
- Facility = man-made/placed item that is not structure
- Resilience = ability to adapt, withstand & recover
- FFRMS = 3 approaches to compliance
  1. Climate-Informed Science Approach (*L.90*)
  2. Freeboard Approach above BFE (*L.96*)
  3. 500-yr Elevation Approach (*L.100*)

# History of Executive Orders

## EO 13690 Supporting Policy:

- National Environmental Policy Act (NEPA), 1969
- National Flood Insurance Act, 1968
- Flood Disaster Protection Act, 1973
- Executive Order 11988, 1977

*Each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities... (L.297+)*



# FFRMS & Executive Order 13690

## New Components of FFRMS



The Suz, 2012



# New Components of FFRMS

## EO 13690 Goals:

- Expand flood management levels (L.253)
- Add nature-based alternatives
- Resilience to impacts of climate change (L.249)
- Move from “*flood control*” to “*flood risk management*”
- Move from “*protection*” to “*resilience*” (L.259)



Photos: Varrella, 2013

# New Components of FFRMS

## EO 13690 Goals:

- Per ASFPM website (<http://goo.gl/5Ggclj>):
  - Increase public safety, reduce flood losses
  - Address problem of increasing flood disaster costs
  - Protect taxpayer investment in actions in flood prone areas



Photos: Varrella, 2013

# New Components of FFRMS

## Updates Since EO 11988:

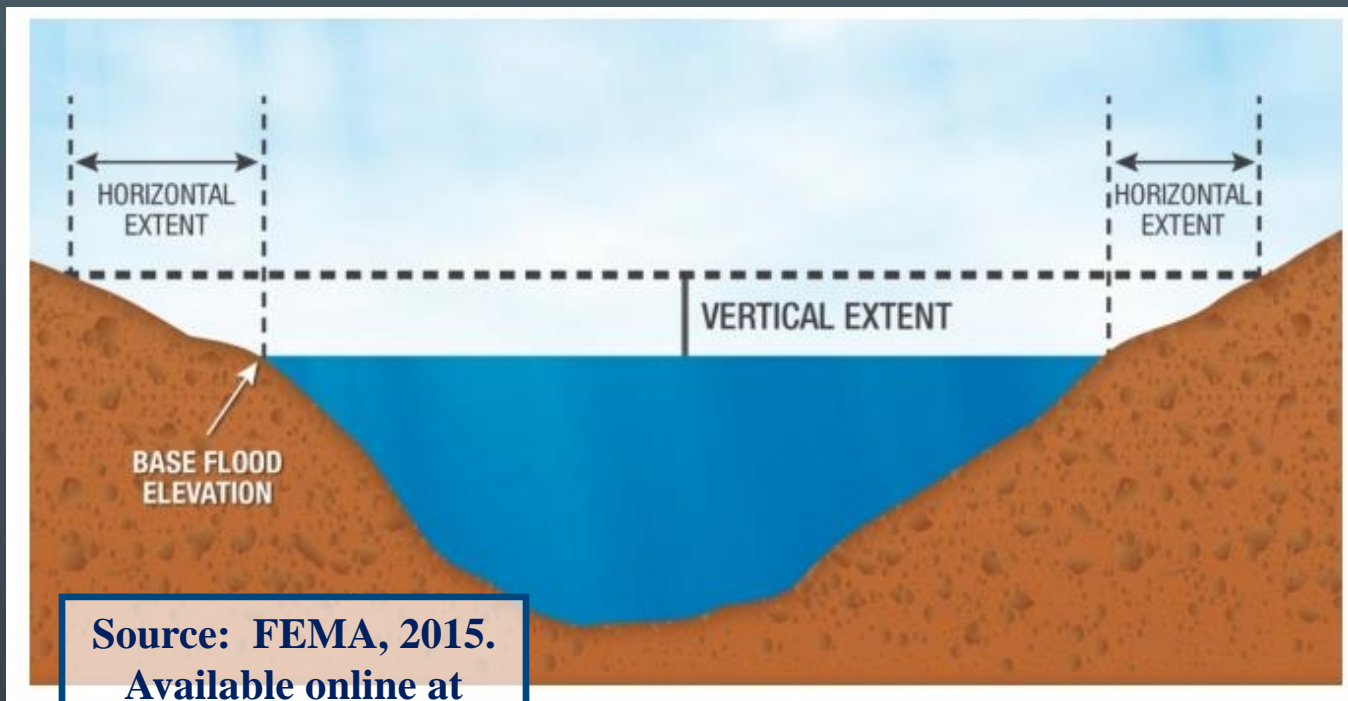
- **Nature-Based** approach for alternatives (Sec. 2[a][2])
  - Avoid FPs if possible
  - Minimize harm to FP
  - Notify the public of change
- New **Climate-Based Sciences** approach to protection
  - Currently ambiguous & intentionally vague
- **Critical Actions** recognized
  - Health, safety & welfare



# New Components of FFRMS

## Updates Since EO 11988:

- New definition of floodplain (not just inundated land)
  - Horizontal applicability outside the SFHA
  - Affects freeboard for critical & non-critical features



Source: FEMA, 2015.  
Available online at  
<http://goo.gl/ZS44Dt>

# FFRMS & Executive Order 13690

## Details of FFRMS

*As Currently  
Drafted*



Photo: Varrella, 2012

# Details of FFRMS

## General Features:

The safety  
of the people  
shall be the  
highest law.

Cicero

Photo: Varrella, 2014

- Federal agencies = 1 year to develop rules & regs
- Elevating structures preferred over filling land (L.597)
- New Construction is... (L.603)
  - New structures & facilities
  - Existing struct.'s damaged by any hazard
  - Existing struct.'s rehabilitated, repaired, altered and with new additions



# Details of FFRMS

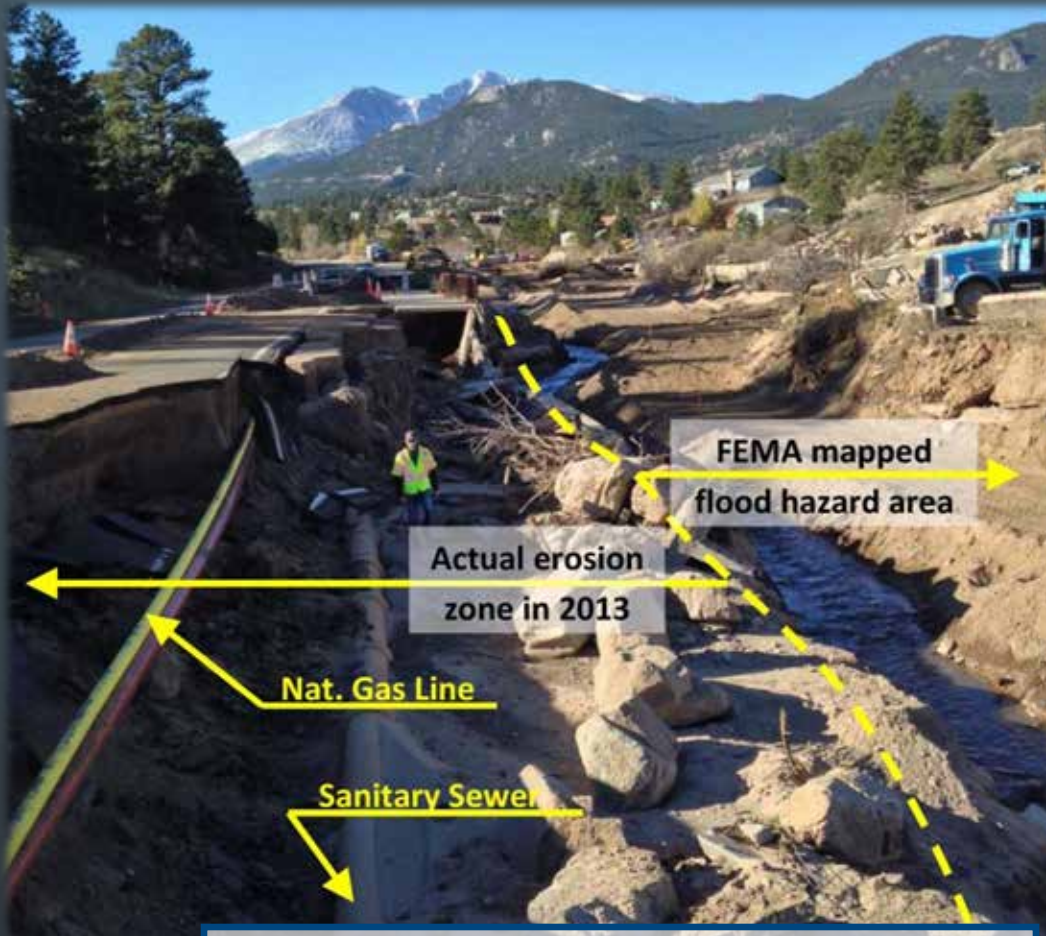
## Flood Elevation & Flood Hazard Area:

1. **Climate-Informed Science** Approach (L.748)
  - Current & future changes in flooding
  - Preferred method (L.799 & 1250)
2. **Additional Freeboard** Approach (L.754)
  - BFE + 2.0 ft for non-critical actions
  - BFE + 3.0 ft for critical actions
3. **0.2% Annual Chance** Approach (L.758)
4. **Or** other method from future **FFRMS updates** (L.758)
  - Exceptions for emergency & National Security



# Details of FFRMS

## Climate-Informed Science Approach:



- Preferred floodplain identification method
- Uses H&H from best available data
- Future development planned
- Future conditions hydrology applied

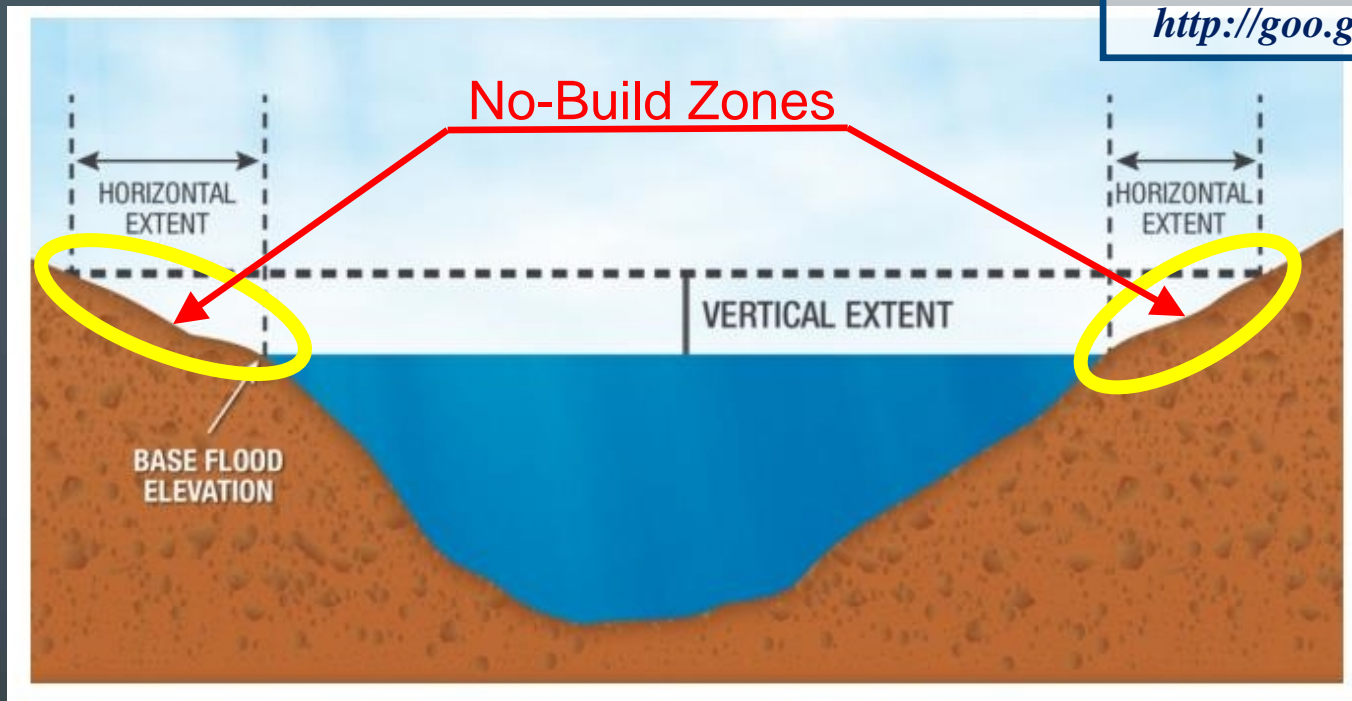
Photo: Fish Creek in Estes Park, CO,  
by Terry Martin, ICON Engineering, 2013

# Details of FFRMS

## Additional Freeboard Approach:

- Vertical component (+2.0 ft or +3.0 ft)
- Horizontal projection for affected area

Source: FEMA, 2015.  
Available online at  
<http://goo.gl/ZS44Dt>





# Details of FFRMS

## Critical Actions:

- If flooded, adds **new dimension** to a disaster (L.838)
- Building **occupants can't move** easily (L.841)
- **Essential** records, resources, & services (L.844)
- If flooded, turns local disaster into **regional disaster** or larger event (L.847)



Photo:  
Varrella, 2013

# FFRMS & Executive Order 13690



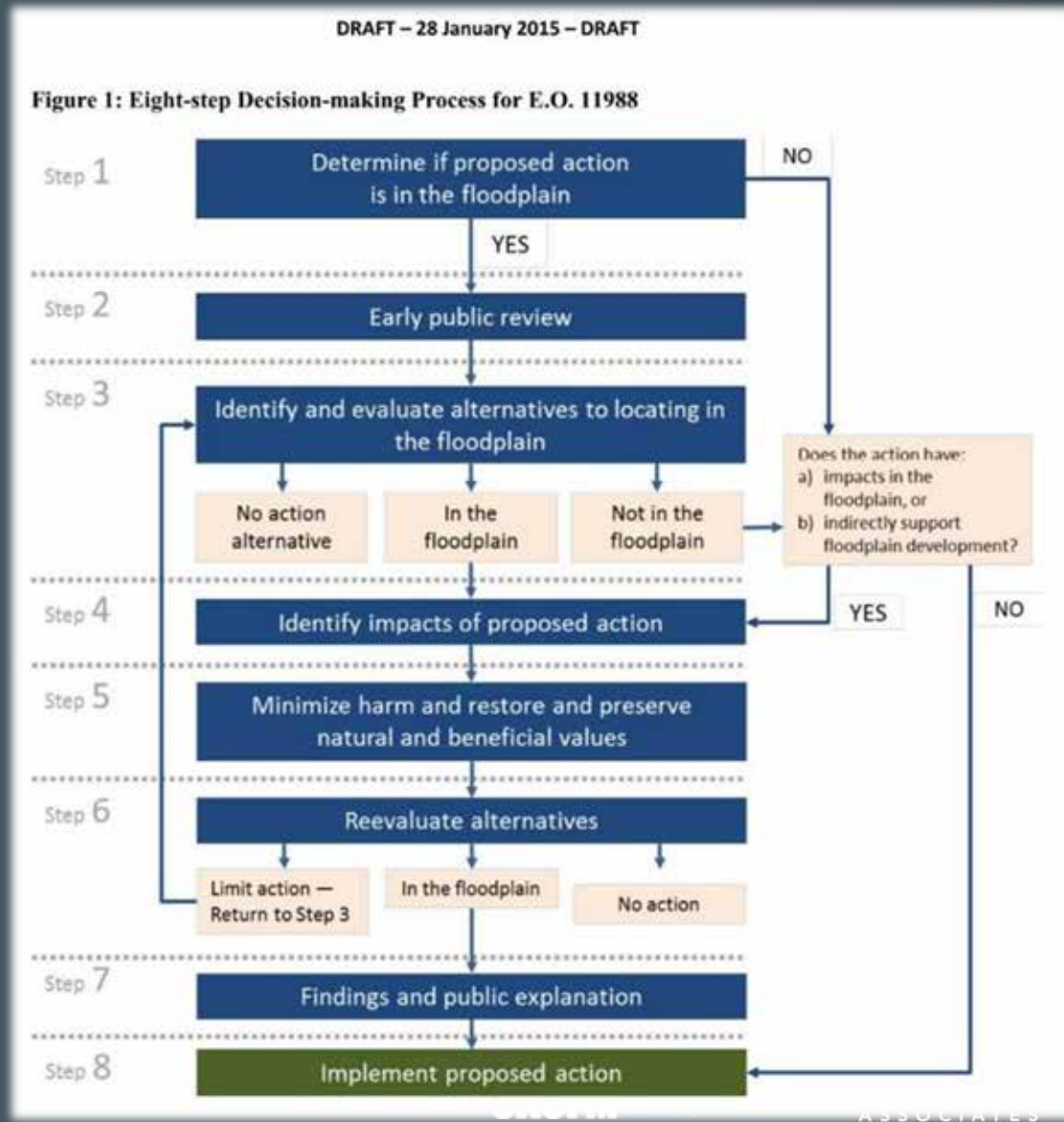
## 8-Step Decision- Making

Photo: Varrella, 2013

# 8-Step Decision-Making

## Evaluates....:

- Type of agency action
- Location of action
- Impacts to the floodplain
- Impact mitigation & avoidance

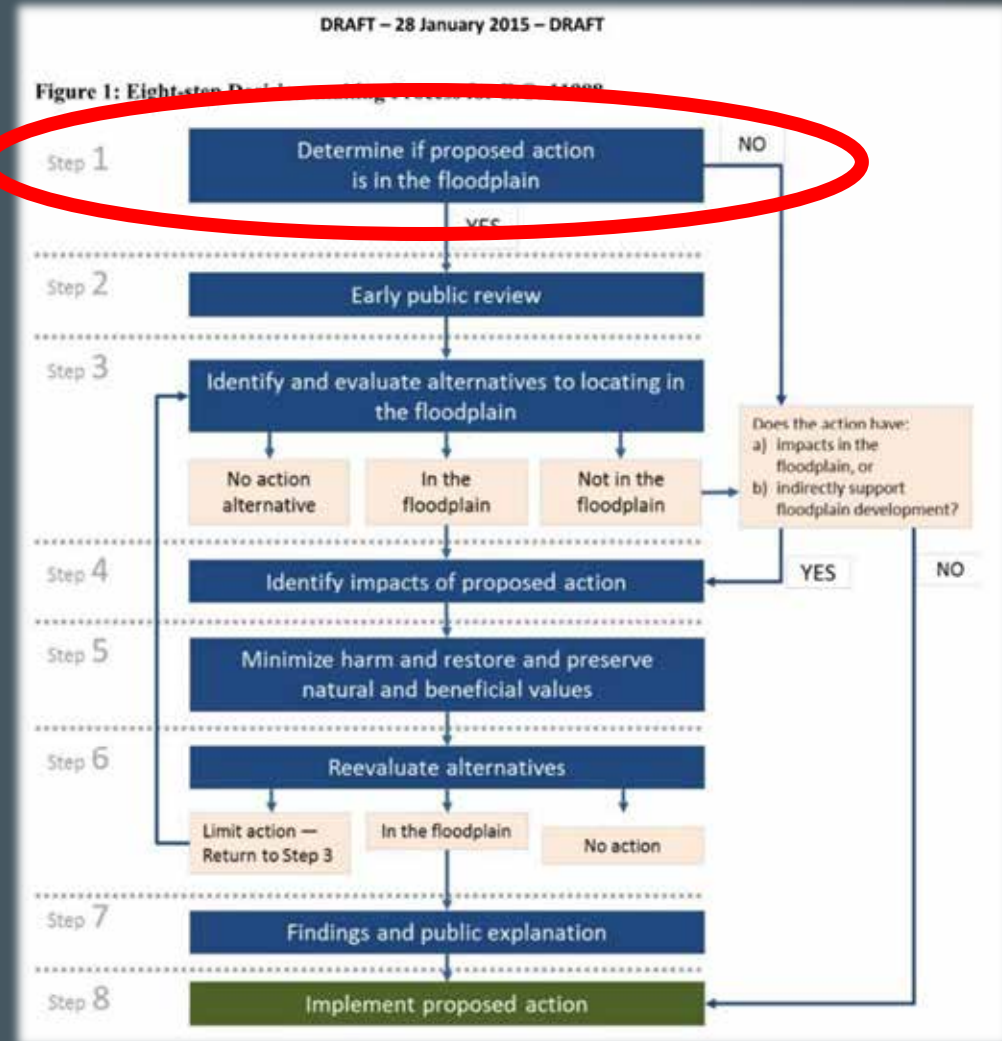




# 8-Step Decision-Making

## 1. FP Impact?

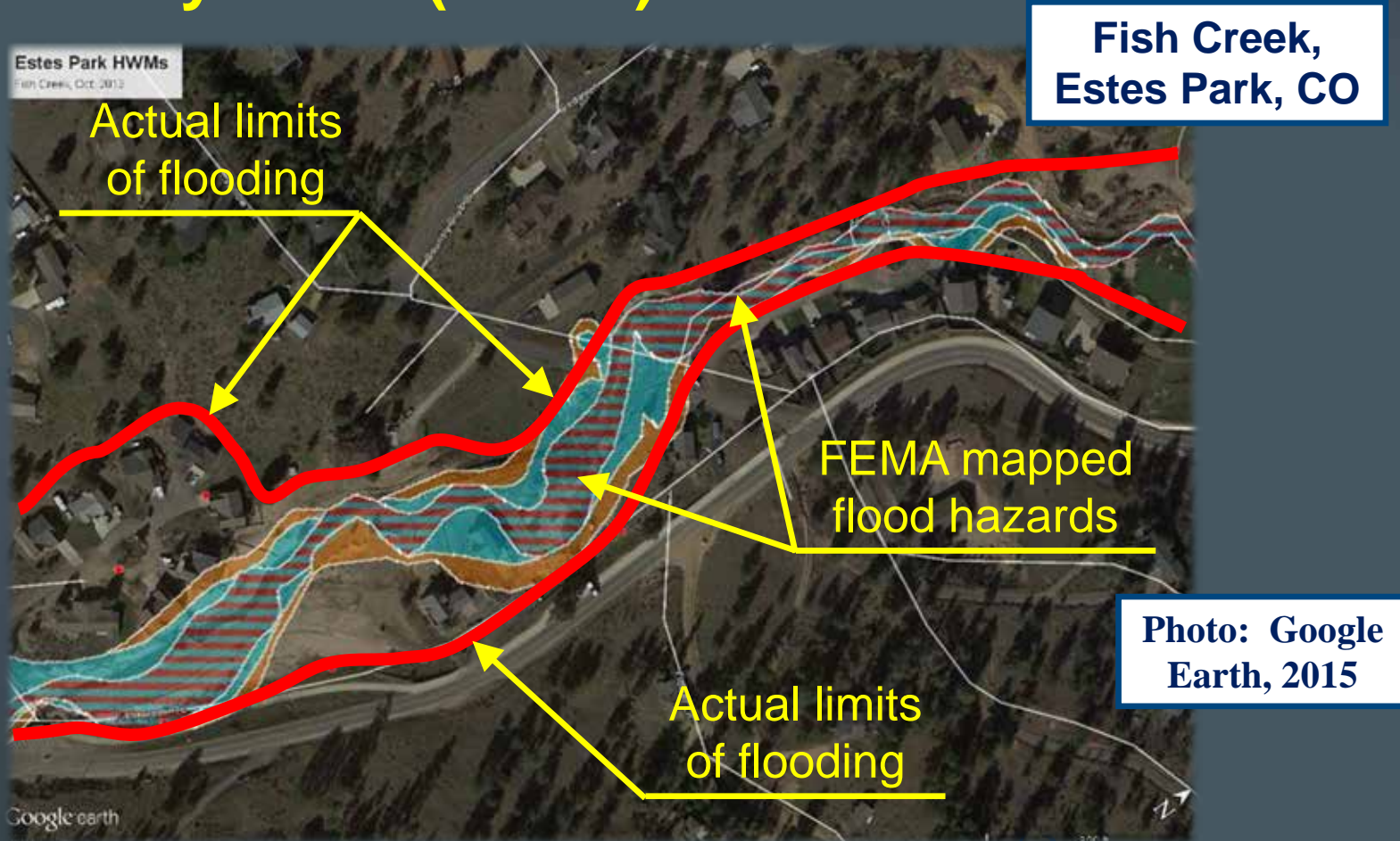
- Riverine or coastal?
- Other hazards?
- If available, use Actionable Climate Science to find FP
- Future conditions H&H?
- Critical actions?
- Advisory BFEs





# 8-Step Decision-Making

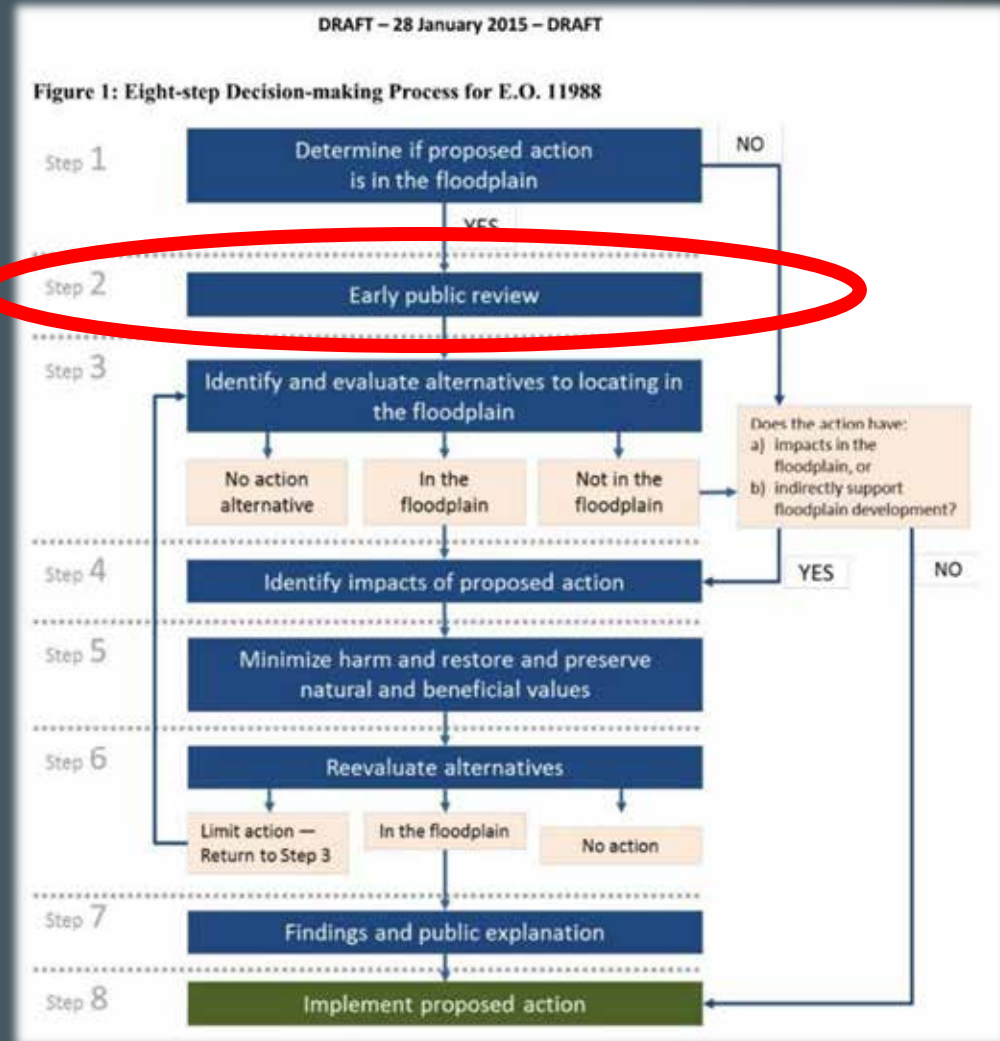
## Advisory BFEs (ABFEs):



# 8-Step Decision-Making

## 2. Public Notice

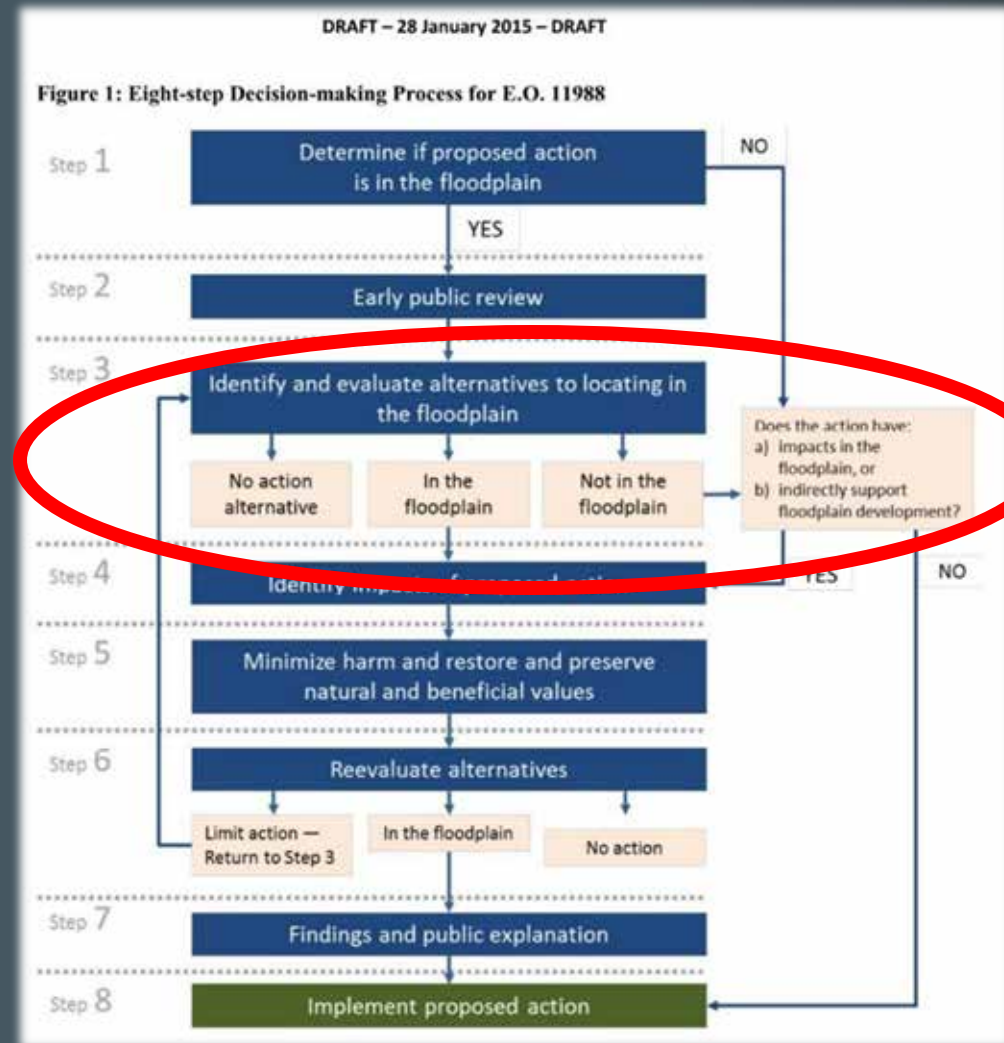
- Let the public affect the outcome of decisions
- Post notice explaining proposed action
- Target stakeholders
- Target outreach mechanisms
- Integrate feedback into decision-making



# 8-Step Decision-Making

## 3. Alternatives Outside FP?

- Do alternatives exist outside the FP?
- Alternative means to succeed elsewhere?
- Viable null option?
- Impacts to consider;
  - Natural
  - Social
  - Economic
  - Legal

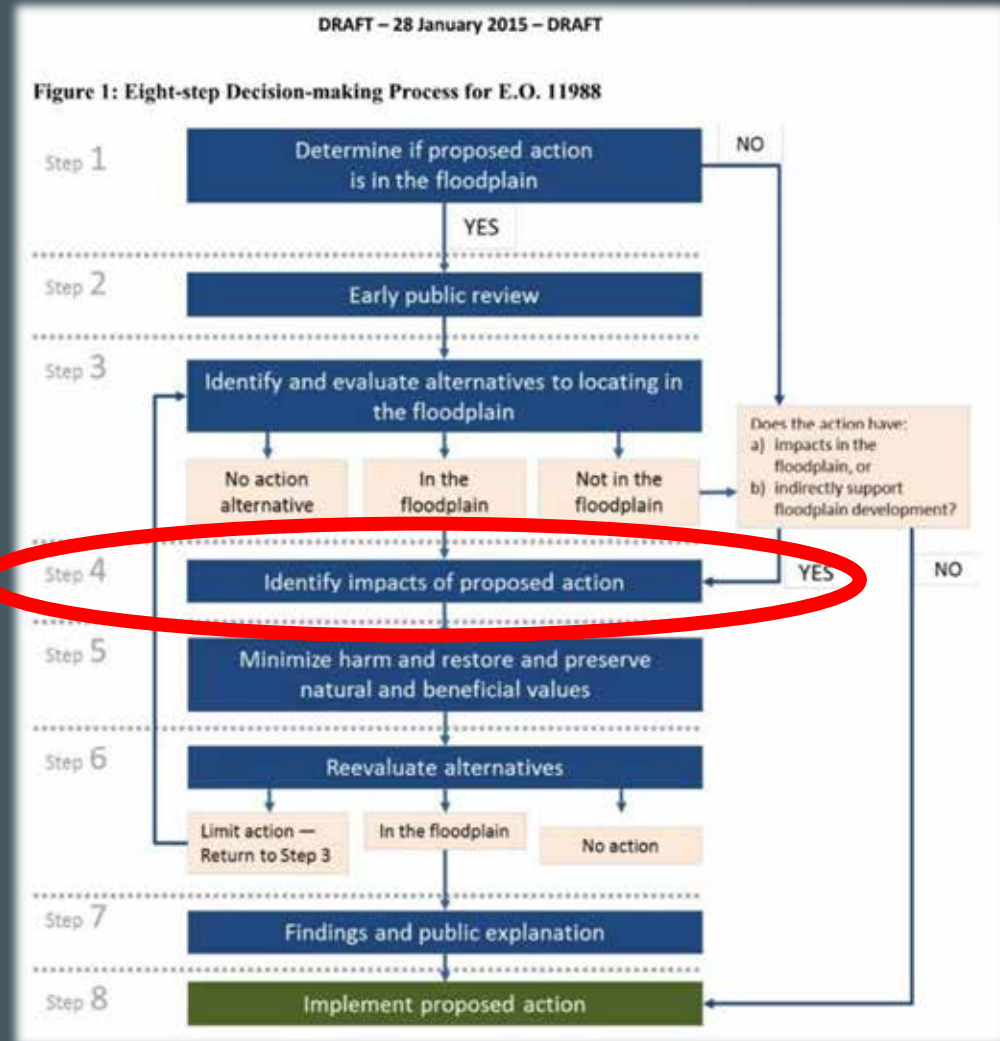




# 8-Step Decision-Making

## 4. Identify FP Impacts

- Tabulate impacts on...
  - Lives
  - Property
  - N&B Functions
- Impact types:
  - Positive / negative
  - Concentrated / dispersed
  - Short- / long-term

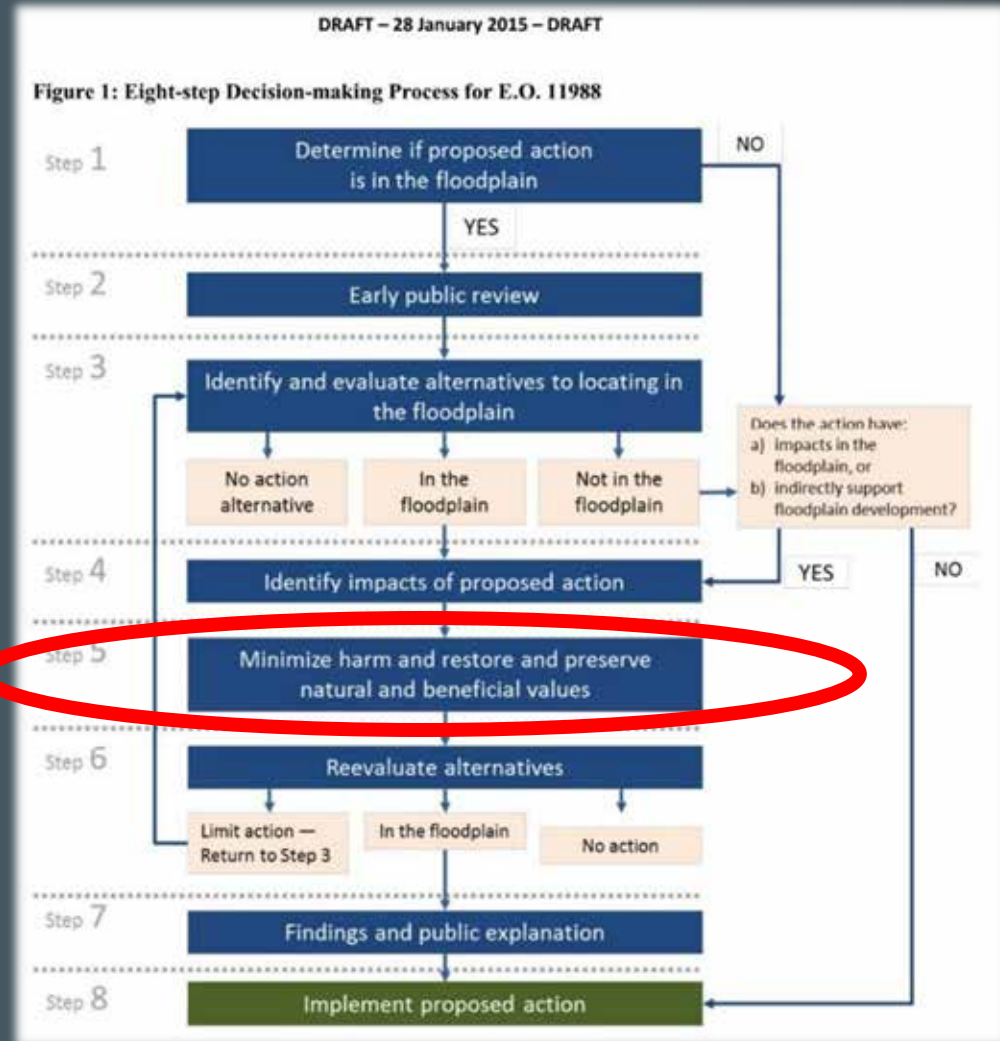




# 8-Step Decision-Making

## 5. FP Impact Minimization

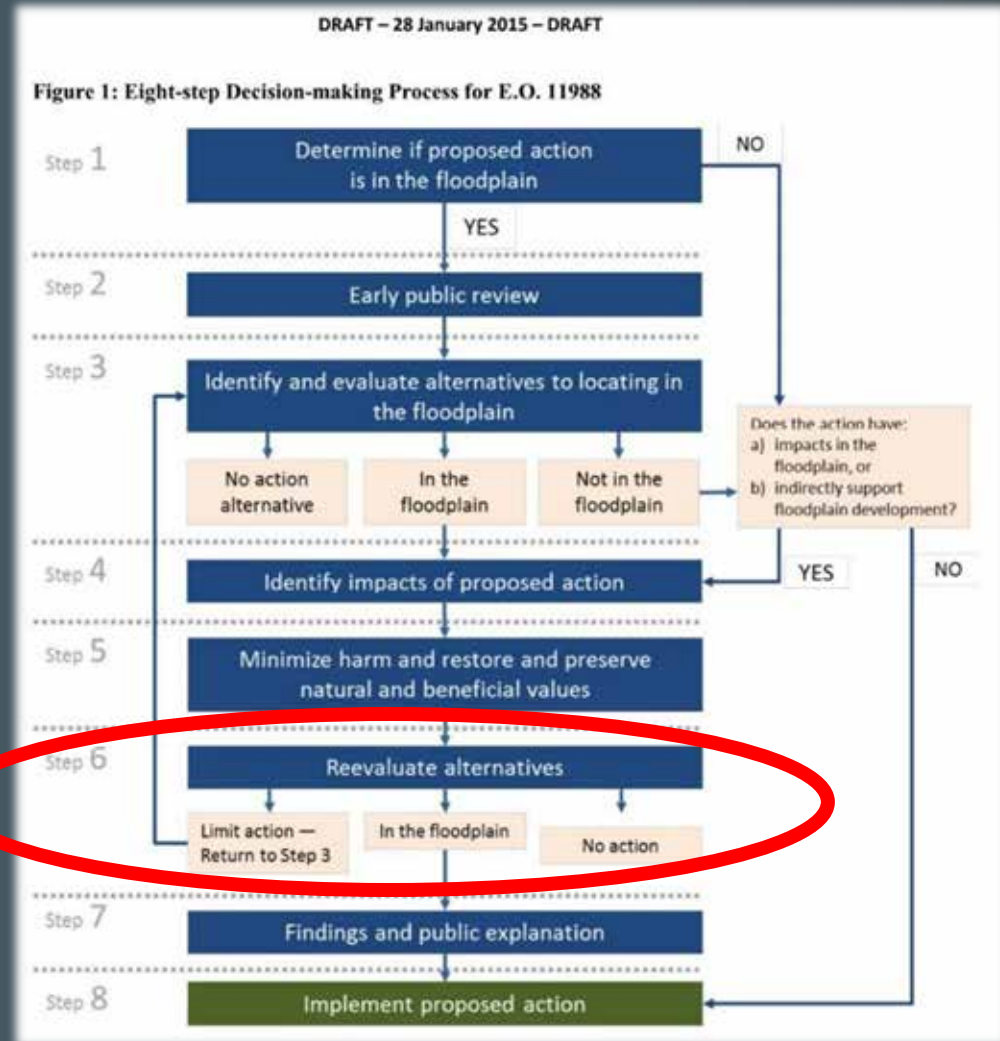
- Applies when proposed action results in harm
- Minimize harm, *or*
- Restore to previous, *or*
- Preserve natural environment



# 8-Step Decision-Making

## 6. Reevaluate FP Impacts

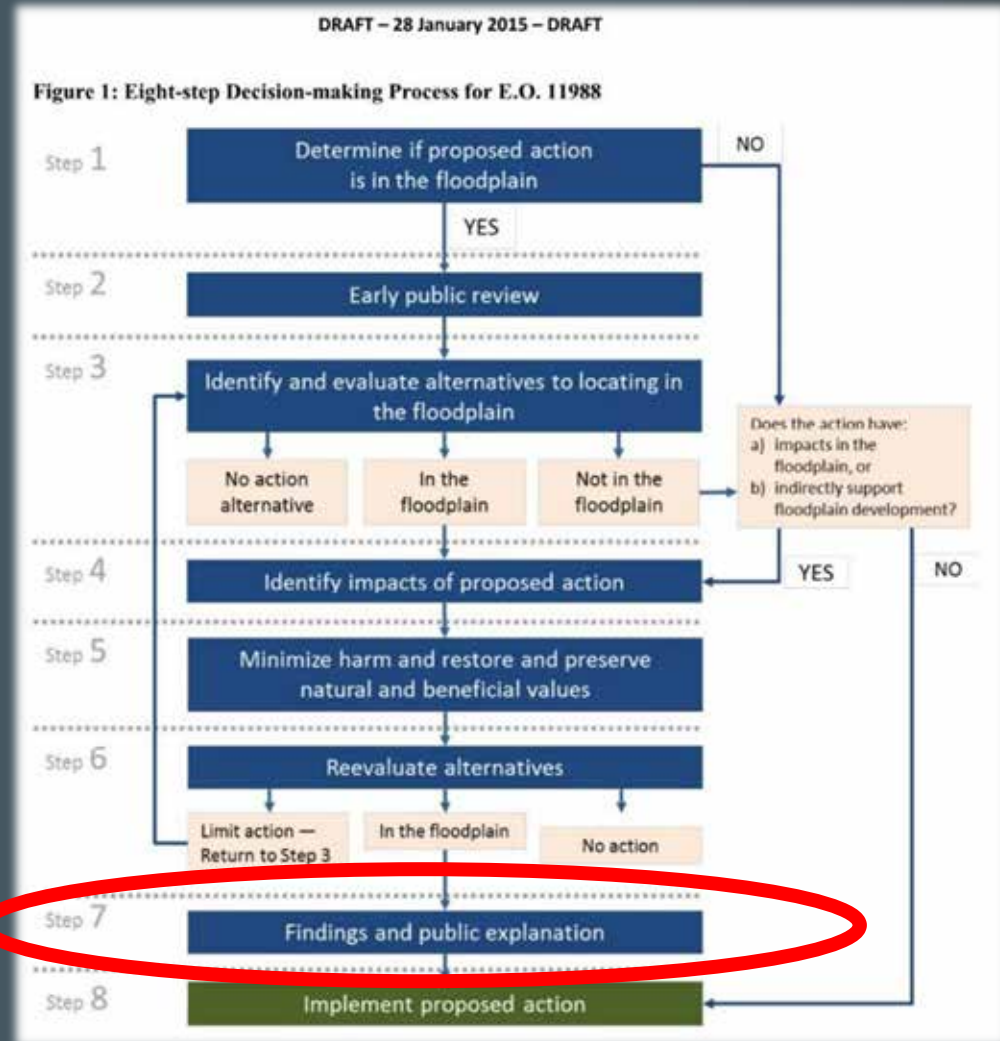
- Final reevaluation
  - Still feasible?
  - Modifiable?
  - Option to relocate?
- Evaluate the adverse impacts of building in FP



# 8-Step Decision-Making

## 7. Provide Public Reasons for Selected Alt.

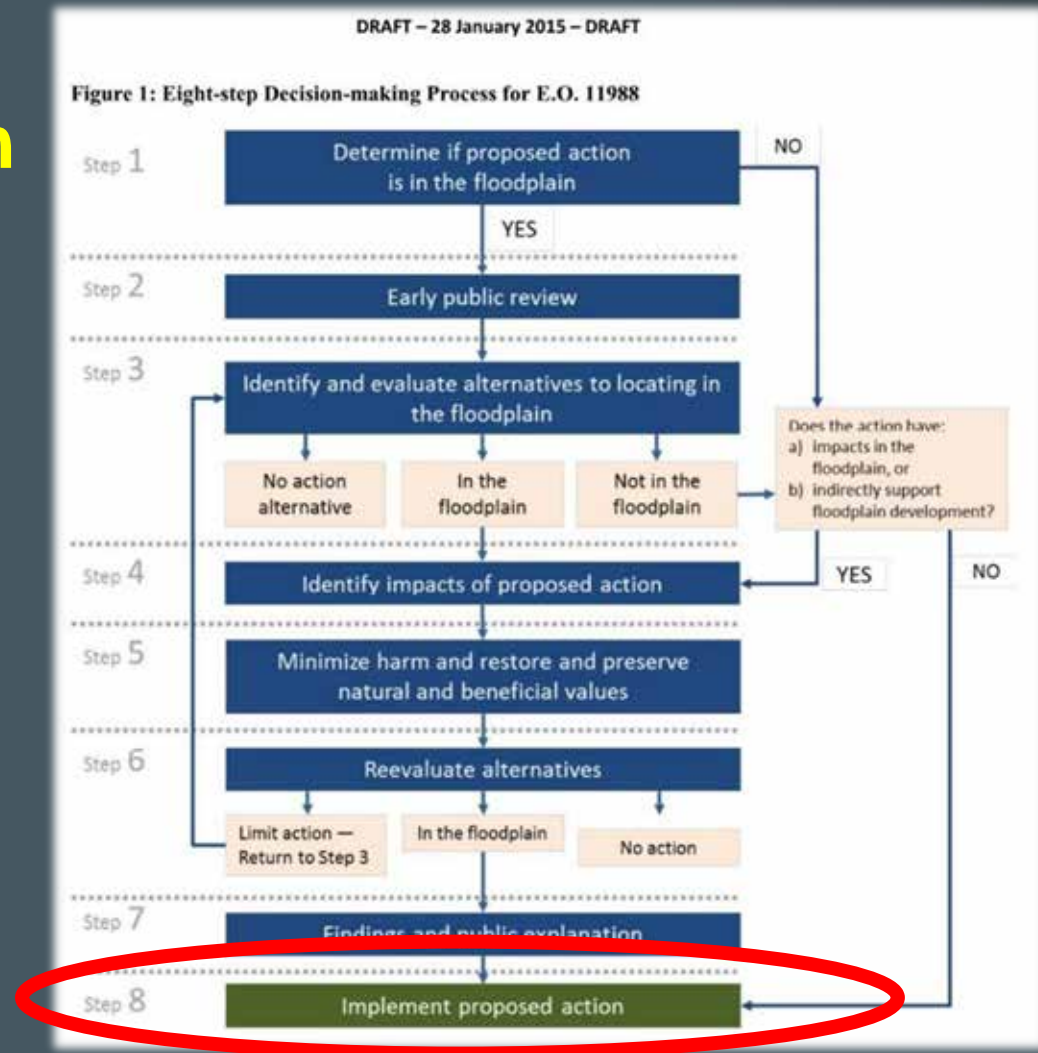
- Explain findings to the public
  - Show tradeoff analysis
  - Post notifications
- All statements in writing



# 8-Step Decision-Making

## 8. Public Response & Implementation

- Go forth and build your public liabilities in the floodplain





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## Colorado Perspectives on FFRMS



Photo: Varrella, 2013

# Colorado Perspectives on FFRMS

## CO Department of Transportation (CDOT):

- Concept seems good
- Not entirely sure what it means for CDOT
  - Include highways?
  - Include salt sheds or maintenance facilities?
- **Clarity in execution** needed for **planning** soon
- Recovery actions receiving positive **public feedback**
  - Showing the science now → must continue
  - Must continue the goodwill & public trust
  - Rulemaking process = transparent & science-based

# Colorado Perspectives on FFRMS

## CO Water Conservation Board (CWCB, 2/2):

- “*Generally supportive of changes*”
- Recommend federal agencies **align criteria**
- Concerned about **complexity of 8-Step** Process
- Questions on **Climate-Informed Science** Approach
  - No trends in heavy precip. expected in Colorado
  - Equal weight for other hazards?
  - Equal weight for future conditions data?
- Supportive of **freeboard** concept in SFHA
  - But....

# Colorado Perspectives on FFRMS

## CO Water Conservation Board (CWCB, 2/2):

- Concerned about **horizontal freeboard projection**
  - Doesn't acknowledge channel meander migration
  - Topo needs updating after movement
  - Costs \$\$\$ & could jeopardize project funding
  - Current mapping inaccuracies can make it challenging to implement right now
- Need comprehensive discussion on **impact mitigation**
- Need **examples of resilient transportation** projects
- Need funding for **resiliency** & **higher FPM** standards



# Colorado Perspectives on FFRMS

## Assoc. of State FP Managers (ASFPM, 1/3):

- Generally supportive
- **EO 11988 language** relatively unchanged
  - “Federal Action” definition unchanged
- Climate-Informed Science = national discussion
- Biggest changes
  - **Added Climate-Informed** Science approach
  - **Added horizontal area** outside SFHA
  - Added nature-based alternatives focus

# Colorado Perspectives on FFRMS

## Assoc. of State FP Managers (ASFPM, 2/3):

- Federal agencies have **flexibility in implementation**
  - **Rulemaking** is typically pragmatic & flexible
  - Opens the door to **innovation**
    - i.e.; VA does not provide loans to new houses on repetitive loss sites based on EO 11988
    - i.e.; FHWA has different standards for different roadways based on EO 11988
- US Army Corps of Engineers may lead climate science
  - Already part of their planning process
  - Should be a good belweather for other agencies

# Colorado Perspectives on FFRMS

## Assoc. of State FP Managers (ASFPM, 3/3):

- CDOT & CWCB already showing leadership
  - i.e.; erosion zones & lateral migration considerations
  - Good example for FHWA
- Recommend commenting now
- Recommend getting involved in rulemaking process
  - That is the time for substantive input
  - Helps get states/locals on better page with Feds
- ASFPM still encourages higher safety standards

# Special Thanks

## Special Thanks to the Following Individuals for Their Insight, Wisdom & Dedication:

- **Holly Piza**, PE, CFM  
UDFCD, *Sr. Project Engineer*
- **Jamie Prochno**, PE, CFM  
CWCB, *NFIP Coordinator*
- **Steven Griffin**, PE, CFM  
CDOT, *Region 4 Hydraulics*
- **Chad Berginnis**, CFM  
ASFPM, *Executive Director*
- **Larry Larson**, CFM  
ASFPM, *Exec. Dir. Emeritus*



# FFRMS & Executive Order 13690



**Thanks for  
Listening**

**Questions?**

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