

OVERVIEW

- clarify the elements that make up Integrated Flood Management (e.g. floodplain management is a component)
- need to clarify the concept of damage to property: damage to structural things; or decrease in immediate worth or value; short-term loss to crops – some damages may result in long-term benefit to soil.
- the term “benefits” is being used broadly to capture multi-purpose benefits
- is there a way to describe the concepts embedded in flood flows, such as the role of *upslope*?
- State investments refer to funding, technical assistance, capacity building, policy direction. Recommendations are not solely directed at State government.

Structure of Strategies

- Should it be “floodplain management” or “floodplain restoration”?
- Floodplain management really captures all of it. It would be helpful to see watershed management, forest management, and floodplain management simultaneously – it's hard to understand the separation without seeing all the pieces. Where does one end and begin?
- Strategies will integrate with each other. Things upstream can contribute to flood attenuation. Floods don't stop at the foothills dam. In talking about flood management, it's called integrated flood management and flood management strategies have been identified – can't say how each fits in. There are disconnects. Flood attenuation is allocated to a very minor role. Somehow in flood management, would like a paragraph called out for each other strategy and give an example of how it can be integrated. I'm not sure we have that yet.
- The current breakout is geographically and landscape neutral – which is good. Flood plain management integrates a lot of important elements. Some historic floodplains are now designated as not floodplains.
- It makes sense to leave several discrete strategies. The term “modify” implies engineering solutions. Perhaps that wasn't intended. Perhaps it's flood risk management. The order of strategies is important – structural solutions were on top, perhaps looking like they are preferred.
- It doesn't seem to make sense that floodplain management is now flood risk management
- There are different ways of parceling this out. Let's be thoughtful about making this a strategic level conversation: who might use these tools and how might they be easily accessible? There is a conceptual FloodSAFE framework that can be brought into the discussion. What are logical groupings and how can they be used?

Facilitation action item: Convene an integration workshop

Implementation

Q: Which entities would implement these strategies?

A: Land use agencies would implement flood planning, standards, design, and regulation

Integration

- In CWP, are we incorporating flood management in a way that encompasses all aspects of flood management, or is the focus on how flood management integrates with water management? One is very broad.
- Floodplain management was traditionally a structural problem; there are also non-structural options. The same open space acts as a sponge to attenuate floods, improve water quality, and

provide habitat. Trying to find a way to discuss water management that allows water management to be viewed in different categories. It creates bit of a tug-of-war.

- An outcome of Update 2009 would be that integrated flood management has a more common meaning. It currently conjures up different things in different minds. What can and does integrated flood management mean? The Water Plan can foster and report out that conversation.
- The new frontier is about how this all integrates. Land use planning in a floodplain, integration is also with groundwater recharge, intersection for multiple benefits: recharge, attenuation, and water quality. The tendency is to plan with more limited focus.
- \We need to address three components: Where should California be going with water and flood management (this will be up front in Volume 1, in describing integrated flood management); bundling tools in meaningful ways (what we're talking about today); and the tools themselves (provide link or have in appendices). That creates the big picture.
- Is *sustainability* folded into the as an objective or driver? Floodplain restoration, ties to land use strategies. A lot of the discussion sounds as though we have active floodplains. Most are cut off. What does *restoration* mean? (e.g. Active floodplain that needs to be restored). How can we recover historic floodplains? What are the obstacles or road blocks to creating new floodplains?
- Look at FloodSAFE goals that occur in each strategy – these 5 areas could be benefit areas for each strategy. Consider the sustainability of strategies. That creates a good roadmap for evaluating and perhaps identifying new strategies.

FLOOD FLOW MODIFICATION

Overview

- When you say flood, what are you referring to? It would be useful to identify what *level of flood* we are addressing. The focus is on flows starting to impact development, different magnitudes of flows.
- Needs broad consideration of flood flows – low flows, higher, and 100-year event (artificial, varying, and limited), residual risk behind levees. Flows that cause damage are less than 100-year.
- Flood flow refers to both rate and stage.
- There's no discussion of *upslope* and it can't be left out.
- Is flood *attenuation* addressed here? Need to discuss attenuation of flows before they become events as a floodflow modification.
- Lower flood flows are important for restoration and ecosystem enhancement. Need to figure out how to deal with things that affect flood flows and how flood flows affect other things. Don't get short shrift to what's discussed in this document, which seems to focus on larger events, flood flows, and management. Floodplains need *inundation*, they need to get attention that they deserve
- The Central Valley Flood Protection Plan is a major *planning* activities effort, which looks at the entire Central Valley flood system. Could see flood flow modifications coming as a result. The conversations here will help FloodSAFE look at alternatives.

Background and Description (Pages 1 - 2)

- Comment: Flood flow modification should address maintenance as well construction. Maintenance has costs and benefits.
- Some floodplain improvements are better described as channelization. Not seen as “improvements.”
- Language for background and description (pages 1 and 2) should be neutral.
- Background, page 1: Frequency, size of flooding – also look at duration.
- Page 4: Channel improvements for increasing capacity typically result in channelization. It doesn't have to be that way. Setback levees increase capacity without channelization.
- Does “flood control” imply control of floods? Or does this strategy address flood management? What terms should we use? Is it about controlling flood processes (that lead up to flood)? Flood process management controls flooding. “Flood control” give false impression of controlling flood. We can look at managing flood risks.
- Regarding terminology and characterization, are we looking at hydromodification?
- Are we talking about flood flow management v. flood flow modification?
- The attempt is to manage flood flows, especially high flows. About 4 – 5 elements capture the range of flood control options. The intent was to focus on structural flood control.– not talking about non-structural flood control measures.
- If this is just structural, what happens to non-structural – is it relegated to restoration? Would like to see heavy emphasis on non-structural approaches to flood flow.
- The breakout between structural and non-structural is helpful. Floodproofing has overlap.
- “Flood control” is generally disfavored, “flood management” is more neutral.
- The overriding strategy might be to ***reduce flood flows***. Should structural and non-structural be discussed together? Need to be mindful of the title we give this. Is flood flow only about structural? If so, needs another title. Or else include non-structural elements.
- Need to refer back to other parts (upslope management and precipitation discharge) that will dictate what structures are needed. This should discuss how to make structural approaches fit in: telling flood managers to be mindful of multi-benefits objectives. This should assist flood managers in understanding that fixes and stream geomorphology can move impacts downstream.

Connection to Other RMS: (Page 3)

- It's the same list for all four strategies – different ones connect in different ways; too broad brush; all need to link to urban land use planning. \
- There are influences between RMSs. Highlight the ones that most relate to integrated flood management. Some have a significant impact. Perhaps a table/matrix of objectives and RMSs?
- The intent is to show other strategies that can benefit floodflow management. This should help direct managers to other resources.
- Need a clearer connection to ecosystem restoration – not sure what's intended.
- Watershed management and land use management should be separate bullets. Watershed management reduces frequency of flood events as well.
- In resource stewardship, acknowledge that flooding has benefits. Listing only setback levees doesn't do justice to that concept. Restoration of soil-forming processes and reversal of subsidence needs to be captured.

- Recreation and other cultural consideration could benefit flood risk management.
- What's the benefit of this section? Would be helpful to have a list of strategies and what their benefits are. In designing flood flow structures to manage flood flows, they can achieve multiple-benefits. Is this list helpful to flood managers? Not sure this is actually helpful.
- Perhaps there is a more macro discussion that is pulled into Volume 1, and then provide more compelling multiple benefits in this section.

Benefits (Pages 3 - 4)

- Comment: Talk about how benefits related to economic benefits and how costs include non-economic costs; tailor recommendations to strategy. Economic benefits should be brought out in every single strategy. Reducing damages could certainly be expanded out.
- Energy benefits include time shifting of release of water. Peaking hydro-power has a role here, especially in the summer. Timing of release and when they operate their facilities.
- Bottom of page 3: improvements providing benefits to the Delta, might actually have detrimental effects (would v. could)
- Isn't a central benefit of flood control structures reducing risks to life and property. Want a multiple-benefit approach, but let's list a few things first.
- Water quality (capturing sediment - 3rd bullet) supports long-term sustainability of floodplain (which is a bigger benefit than what's stated). Water quality is a small statement. Movement of water into floodplain from impervious surfaces moves sediment, changes energy transport in multiple spots. If this only looks at the changes in the floodplain – that process starts further back and ends further down. And is addressed through options other than structures. It's about changing where sediment is mobilized and letting it go to where it's intended to go.
- Potential benefits include 200-year benefits. Don't see something for an adaptation strategy. Will climate change affect 200-year benchmark (see page 5)?
- One benefit is erosion control. Are we also looking at coastal and sea-level rise and structural fixes?

Costs and Issues (Page 4 - 5)

- This needs to show a range of *costs*, since things can be done in different ways. Setback levees on a large scale would be expensive.
- Move the discussion of climate change to issues (delete from benefits section). Uncertainty of accommodating flood flows is an issue – not sure how to design facilities.
- Vegetation and real estate issues will be huge hurdles to overcome with endangered species. The Water Board is changing definitions for wetlands and riparian areas. Might want to include that here. The real estate issues is about levee of certification for FEMA – if within 15 feet of levee, not certifiable. Are you going to move those people out? This also relates to staying in the Corp's inspection program. Also, real estate for acquisition to expand floodplain. Legal question, some have been permitted. That's a long evaluation process for solution set.
- Residual risk is a huge issue.
- Coastal flooding not addressed in the document. Include alluvial flooding.
- A big challenge on risk modeling that we don't have risk modeled yet on systems and watersheds.

Recommendations and References (Pages 5 - 6)

- Recommendations need to be tailored, with a tight nexus to issues, as well as to costs and benefits. It needs to be very clear about whom the recommendation is addressed to.
- A big recommendation is for data collection and analysis of flood risk.
- Are there three areas of key ***recommendations*** – flood planning and needs assessment; water plan recommendations, and a direction for investment?

FLOODPLAIN RESTORATION

Background and Description

- Benefits of floodplains requires flooding. Strategies should reduce likelihood of flood damages, not reduce likelihood of flooding.
- This focus at the moment is some recognition about preserving existing floodplains. Floodplain conservation is very important, maybe this should be brought in. In naming this floodplain restoration, seems more focused on using existing natural floodplains to manage flood risk, not restoring floodplain function. In title, need to say floodplain protection and restoration of floodplain function.
- Floodplain restoration implies that there's going to be floods, discuss what's been done in some areas (e.g. flushing flows in Trinity) within floodplain restoration. It seems in any system that capacity of reservoirs links with operation of flood control structure upstream.
- Floodplain restoration is also a place where coastal flooding is important – that needs to be reflected here. Impacts increase with sea-level rise. Moving people and property away from areas that flood is an important factor in flood management.
- The forest management strategy discusses use of check dams in meadow restoration. (Reminds us that dams is a wider array of things.) This also includes grade-control structures, sometimes called “plug-and-pond.” Dams usually refer to structured that are at least 25 feet in height.

Benefits

- Comment: Need to state benefits of protecting agriculture, as well as development. This should be called out, not just embedded in economic growth.
- Carbon sequestration is a floodplain benefit (part of the AB32 equation).
- Discuss the potential foodweb support that FP can provide. It an important part of the opportunity.
- Protection of lives and properties should be emphasized.
- Can't achieve peak reduction benefits that justify costs.
- How do we value ecosystem services? Ecosystems have functions. Those services can be incorporated into benefit evaluation, need to look at non-market elements. Need to tease out the benefits of floods themselves. Is an issue to tease out. The concept of floodplain restoration perhaps belongs with ecosystem restoration.

Costs

- Tie potential costs to what the project is; restoration is dependent on structural elements – could identify typical ranges of costs per project or mile.

- The original consideration for cost was for comparative purposes, in looking at comparative costs of implementation for different strategies.
- The 2005 Update horizon was 2030 – how much more of the strategy could be implemented by 2030; then how much that would cost. Update 2009 is looking at a planning horizon of 2050, with decadal increments. This was hardest section to work on with subject matter experts. That's why we went to ranges. For example, how much it would cost to construct the check dams.
- If we're comparing toolkits, know that some are mutually exclusive - which affects costs. List the types of things that might incur costs and what those costs might be.
- It's hard to get costs – look at the Dutch “Room for the River” and “Living with Water” programs and getting a feel for the political direction.

Issues

- Climate change predictions lead us to more severe and frequent floods. Need to store flood water in the floodplain.
- A potential major issue is creek restoration from a flood control perspective – cost/benefit ratios don't justify them. Looking at off-channel options.
- Heard population growth but don't really see it here. Land use planning policies are the real issue; population growth might be linked to that.
- There is a lack of institutional framework (funding agencies, programs, grant opportunities) that creates implementation issues.
- Water quality benefits are mostly about sedimentation. Methyl mercury is an issue with restoration – this is something that has been coming up.

Recommendations

- Recommendations should address challenges to implementation. Or take advantage of opportunities.
- Need to think about specific recommendations for floodplain restoration; these current recommendations are required by law.

Climate Change

- Climate change an issue that will have to be dealt with, in writing the different strategies. Climate change could improve the efficacy of implementing some of these strategies, providing opportunities as well as challenges. What strategies could take advantage of increased precipitation?

FLOOD IMPACT MODIFICATION

Background and Description

- This strategy deals with the potential to deal with the impacts of floods themselves. Making decisions to reduce risk and enhance personal safety.
- Documentation of multi-hazard mitigation needs is important. From the perspective of the people of California, this is where they interface, where they know this affects them. This could motivate people to take action.
- Regarding interface with public, the word modification doesn't convey dealing with adverse flooding impact; it doesn't resonate with larger audience. Is this flood damage reduction?

- Use the term “damage” in the context of Prop 1E, where there needs to be a reduction in the flood damage.
- Is this strategy about reducing flood risk/harm/loss? For the lay audience, this doesn't include flood flow management – not understanding that aspect; this goes back to risk management and structural/non-structural approaches. It's a little misleading, since other strategies also deal with reducing flood risks.
- This is about flood preparedness, response and recovery; mitigating negative effects upon people and reducing flood damages. It's about residual risk preparation.
- Say that we're going to identify flood risks and inform investments. Yes, floods will happen. An appropriate goal for flow reduction would be to reduce damage.
- In the flood insurance description, describe the FEMA map modernization process. Explain that FEMA shows 100-year floodplains and CVFPP shows 200-year floodplains; these are important for public education.
- There is a good climate change connection here – a lot of communities are developing climate change adaptation plans, including responses to increased flood risk. ICLEI has an adaptation guide book for local governments.
- Include flood easements for agricultural lands.
- Under disaster preparedness, list floodplain management and the FEMA community rating system.
- Under post-recovery, mention CORP rehabilitation and inspection program to return to pre-flood conditions. Returning to functionality – impacts to long-distance infrastructure are broader than the flood area.
- Stormwater flows are addressed in the RMS for urban runoff management.

Costs

- Add that there is a cost for flood insurance

Issues

- Include Misunderstanding of the 100- and 200-year floodplains makes it seem safe to develop in floodplains; properties closer to the river are subject to 50-year floods; greater public education as possible mitigation.

FLOOD SUSCEPTIBILITY MODIFICATION

Background and Description

- This strategy targets regulating and controlling development in the floodplain, which will reduce damage.
- Flood warnings probably belongs in the strategy for flood impact modification
- Insurance goes in both directions – a little different spin on insurance might be taken here. Example: Bundling it to fire and homeowners insurance or bundling to taxes and assessments.
- Agricultural assessments belong in the section on development and redevelopment policies. The Central Valley will have to prohibit development by 2009/2013; need flood management policies.
- Costs must be born by local governments, there is a lack of funding for implementation.

Issues

- Local control of land use is an important issue in implementation
- This affects where population grows; climate change affects the way that water comes down into floodplains.

Risk

- What is flood risk? The corollary is appropriate level of protection, is a corollary to risk.
- The European flood directive came up with document called “language of risk.”

Recommendations

- Most floodplains are developed, making many recommendations are difficult or impractical. Unless there is an overarching strategy to evacuate the floodplain, many of these strategies won't work.
- The recommendations are Central Valley centric. Need to include coastal and alluvial flooding.

PARTICIPANTS

Sara Agahi, County of San Diego
Betty Andrews, PWA
Mark Biddlecomb, Ducks Unlimited
Boni Bigornia, Arcadis
Josh Brown, SRCAF
Katrina Brown
Peggy Chiang, Arcadis
Les Clark, Nolte Engineering
Mary Della Valle, Region 6 Water Board
David Ford, Consulting Engineer
Vince Geranimo, Philip Williams and Associates
Kamyar Guivetchi, DWR, CWP
Lidia Gutierrez, Gutierrez Consultants
Bruce Gwynne, Dept. of Conservation
Mike Hardesty, Central Valley Flood Control
Pal Hegedus, RBF Consulting
Al Herson, American Planning Association
John Hopkins, IEH
Mark Horne, PBS&J
Brian Keating, Placer County Flood Control District
Luanna Kiger, NRCS
John Mills
Aaron Parke
Dave Peterson, Peterson Brustad
Melanie Powers, CABY
Mitch Russo, Amador Water Agency
Al Schiff, Public Utilities Commission
Judy Soutiere, US Army Corps of Engineers

Susan Tatayon, The Nature Conservancy
Iovanka Todt, FMA
Bori Touray, Parson Brinckerhoff
Craig Von Barga, CDM
Keith Wallace, MWH
Alex Westnoff, Delta Protection Commission
Stan Williams, Bay Area IRWM
Ed Winkler, CH2Mhill
Steve Winkler, Winkler Family Farms
Betty Yee, Region 5 Water Board

DWR and Facilitation Staff

Abi Aderonmu, DWR
Jim Coe, DWR
Sherry Constancion, DWR
Steve Cowdin, DWR
Paul Dabbs, DWR
Megan Fidell, DWR
Tom Filler, DWR
Ted Frink, DWR
Todd Hillaire, DWR
Jennifer Kofoid, DWR
David Martasian, DWR
Lew Moeller, DWR
Allan Oto, DWR, FloodSAFE
Michael Perrone, DWR
Lisa Beutler, CCP
Judie Talbot, CCP