Springflow Habitat Protection Work Group Meeting 6

Agenda

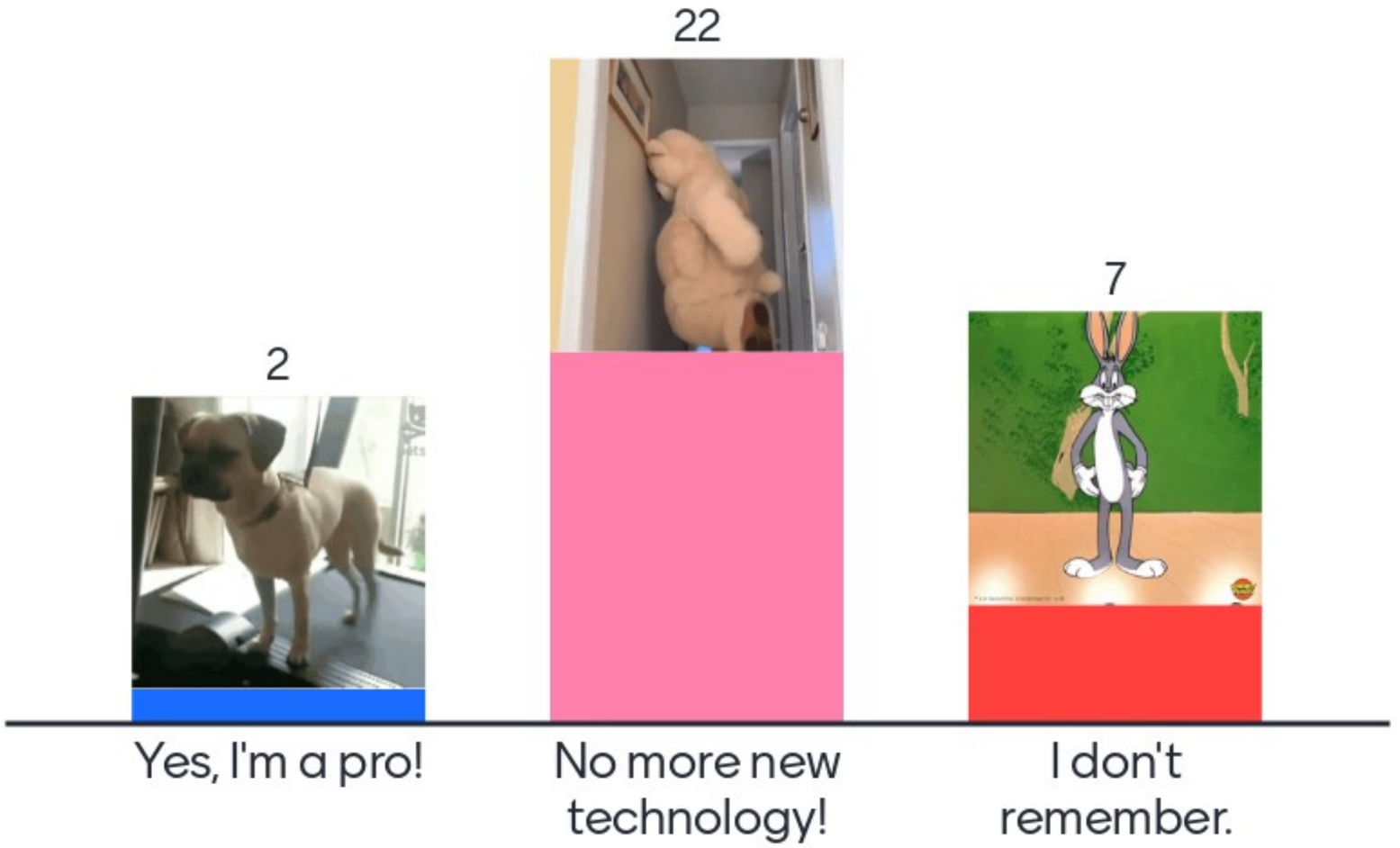
- Meeting logistics
- Confirm attendance
- Public comment
- Work Group decision process
- Overarching issue 1
- Overarching issue 2
- Overarching issue 3
- Public comment
- Future meetings

Meeting logistics

- Microsoft Teams features
- Support team
- Welcome to polling

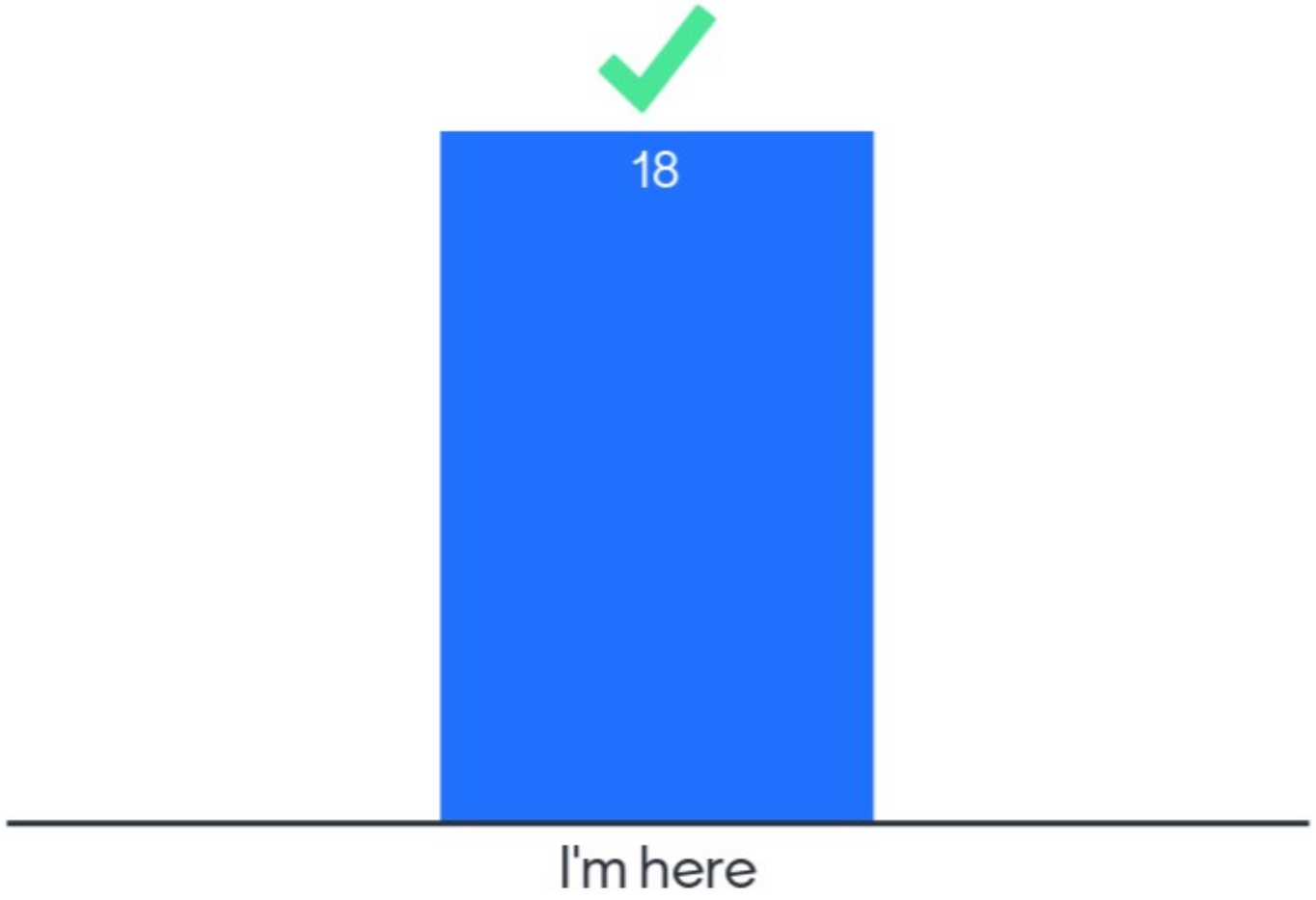
All: Have you used Mentimeter before?

Mentimeter



Work Group (WG): Confirm Your Attendance

Mentimeter



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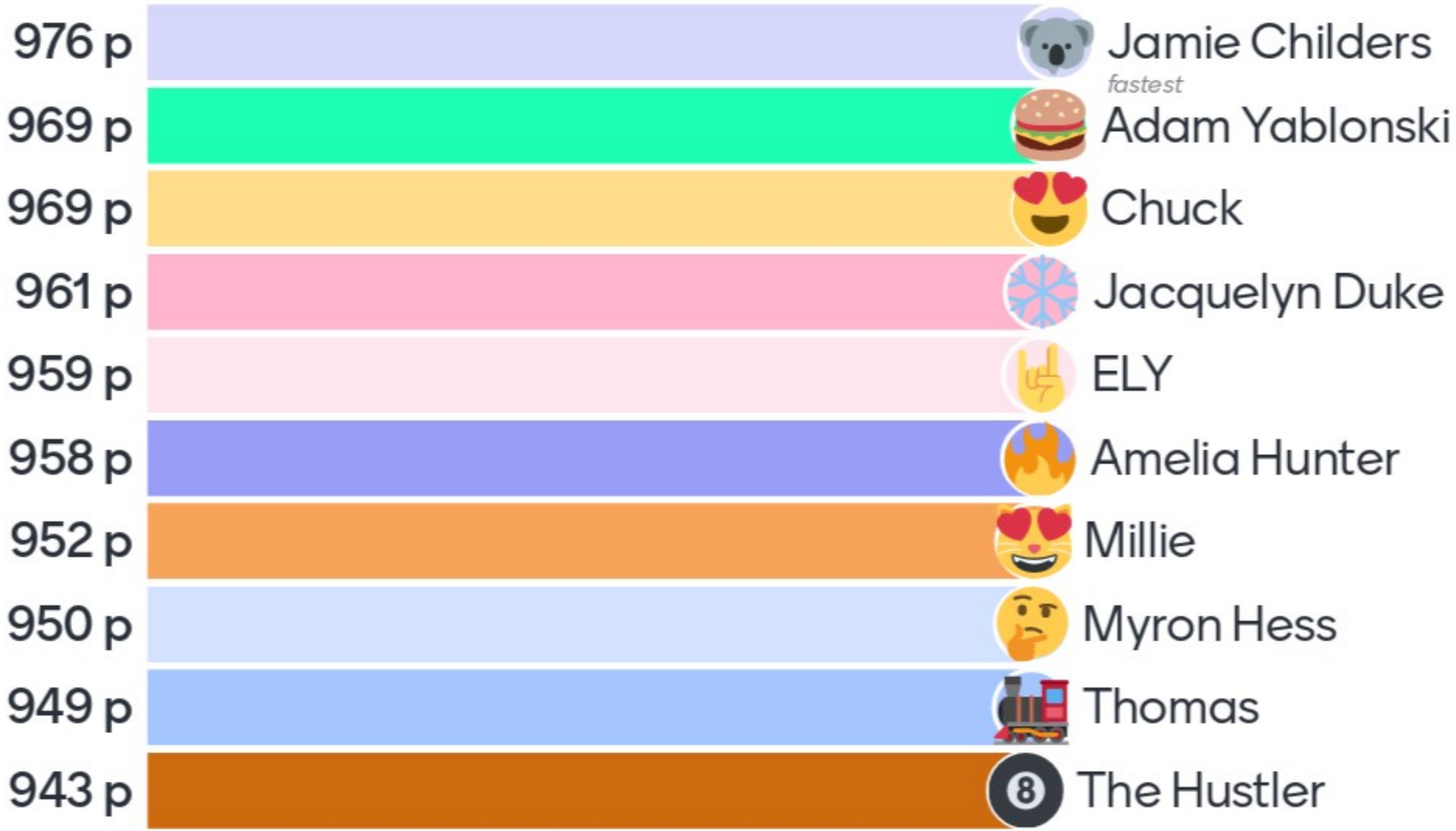
Thanks for letting us know you're here!

Mentimeter



Public Comment

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Work Group decision process

All: What questions related to Issue 1 should the Work Group consider:

Mentimeter

WG virtual sessions one and two presentations reassured me that the current model and activities are protective. However, I am not opposed to the following suggestion of plugging the WQ data 2011 lowest flow DO in as a means of sensitivity check.

What is the effect on dissolved oxygen in spring runs and Landa Lake from vegetation die-off during extended periods (more than 6-months) with flow below 80 cfs in the Comal Springs system?

Impacts to habitat quality under low flow (eg., increased sediment, algae, temperature, decreased dissolved oxygen). How suitable habitat for endangered species changes

Modeling should incorporate predictions for future drought conditions using Dr. Hayhoe's models built for central Texas conditions.

One of the primes (Hardy) seemed to confer that additional WQ data would be a complexity for any current model or actually any modeling platform. This seems to align with the direction that our WQ Workgroup took during Phase I.

What are the effects of extended low-flow (below 80cfs for six months) and vegetation die-off on DO levels in Landa Lake?

Is the Hardy model adequate to evaluate the effects of <80cfs?

The WQ Workgroup set the current parameters of what is available and has not been at all discussed in this process context that questions regarding WQ

I am not opposed to the potential of permit holders reinvigorating activities related to the COI (Certificate of Inclusions) as contemplated and potential control regarding recreational activities that have the potential to adversely impact WQ

All: What questions related to Issue 1 should the Work Group consider:

Mentimeter

Any model rebuild will contain some amount of uncertainty. What would the impacts of management be with new results?

Storm water sampling has mostly been incorporated during high flow events – should there be more concern of point sources during low flow contributions from localized runoff?

I believe the concern is two fold in regards to the old channel. 1) will the assumed flow reach the Culvert to Old Channel and 2) what habitat downstream in the ERPA will sustain temperatures. Have we compared data from 2014 drought to modeled temps?

providing flows of up to 80 cfs are not achievable both politically and monetarily.

the springflow in spring lake also needs to be evaluated. spring lake staff have noticed historically that springs shift as flow decrease. the upper springs diminish.

A. If the flow rates identified in the flow split table are met, wouldn't temperatures be somewhat homogenous at the split between Old and New?

Using more than one model may be useful. Averaging over several models can help identify components that are not accounted for by any single model.

Planning for WQ activities of the permit, which was/is a pragmatic approach of constituent testing. The WQ Workgroup set the current parameters of what is available and has not been at all discussed in this process context that questions regardingWQ

Is 80cfs the best value to use, or should it be lowered to reflect more recent findings?

All: What questions related to Issue 1 should the Work Group consider:

Mentimeter

With regard to the concern of water temperatures in the OC during extended low-flow periods: bathymetric surveys and flow-path modeling may be needed to determine if springflow discharge from western shoreline will be able to enter Old Channel...

Should a more detailed analysis of Nutrient stormwater load contributions be investigated to evaluate algae blooms and DO swings?

Should changes in CO2 levels at SM be considered for low flow conditions related to water quality?

Can the Hardy model tell us which spring/seep outlets will be flowing at 80 cfs and below?

Evaluation of potential for vegetation die-off in Landa Lake during extended periods of low flow affecting DO

Potential for low DO in Landa Lake

Does low temperature springflow bypass culverts to old channel during low flow?

Use data collected in 2014 to validate WQ model results

i think chad answered the questino for the short term that temps are not an issue for water quality down to 60cfs. the question is can wq be sustained over the long run

All: What questions related to Issue 1 should the Work Group consider:

Mentimeter

How well does the Hardy model represent water quality when the 2014 drought is modeled?

If there is an increase in vegetation in the San Marcos, would that impact DO at low flows?

what is the status of the vegetation modeling? Sounds as though it may be useful for evaluation of flows below 80cfs.

It would be nice to see the buckets/comments, but reserve the option to expand or contract by combining buckets.

Hardy's Quale2 report needs evaluation wrt to broader water quality modeling understanding. There are at least 3 recent reviews of water quality models strengths and weaknesses - context and comparison would be helpful for confidence and assumptions

to Tom's point. as flows decrease, pollution concentration increases, and CO2 increases in association (and DO decreases). turbidity is a likely increase especially if recreation continues. there are many negative factors that will impact WQ

We all understand this is a Take Permit? We know there are some species loss during instances. Since we got a glimpse of an empirical time 2014 for this in SM and another in Comal. Why not look at take trends.

habitat loss, prey decrease, predator accessibility... The bottom line is that a dramatic change in springflow regime for 7 years is a hard hit on the ecosystem

Low flow/vegetation interactions at low flow may limit mixing in the lakes, isolating areas of dense vegetation from cool spring flows.

All: What questions related to Issue 1 should the Work Group consider:

Mentimeter

You can sanitize some of these comments - Please.

>During earlier periods there were discussions field level lab simulations to test concepts should resources be shifted to do this level of science for DO and vegetation? (And When)

A

Do we believe any conclusions of the Expanded Water Quality Workgroup in 2016 is applicable?

Some of the comments appear to cover objectives 3&4?

What about CSRB at San Marcos Springs? Why have they never been considered or mentioned?

Can we calibrate the Hardy model to 2014 drought data to better understand if the accuracy of the model?Monitor changes to DO and Carbon Dioxide related to vegetation & nutirents etc. during lower flow over the next permit period in both lakes.

Spring Island has highly sedimented over the decade and springs are covered in silt. Is anything going to be done to restore the habitat?

Investigate substrates in spring runs

All: What questions related to Issue 1 should the Work Group consider:

Mentimeter

With extended periods of drought, rainfall events will occur periodically and wash sediments into habitat. Consider studying potential impacts.

A

Evaluate flow paths for major spring features at Comal Springs

Installing shallow well for CSRB habitat evaluations has the potential to connect conduits that were not previously connected. What safeguards would be appropriate?

Before we have the ability to determine CSRB retreat into orifices and re-emergence as safeguard against low-flow, we need to wait for some of the genetics/capturing studies to be advanced.

Refer to Dr. Nair's dissertation chapter on CSRB water temp and DO limits

Need to understand how riffle beetles can survive extended periods in substrate

All: What questions related to Issue 2 should the Work Group consider:

Mentimeter

We may have heard from participants of the Beetle (CSRM) during these sessions I am much more inclined to leave the science up to the specialized consideration of this groups work - Can someone update for the group?

Which spring openings will still be flowing below 80cfs and what is CSRB habitat like at those locations/flows?

Does the low flow condition affect the reproduction or life stage development of the beetles even if they can migrate to subsurface layers? Population should look at more than just if they can live under those conditions.

The Genetics work that lends itself to the population level understanding appears promising to follow-up on

CSRB issues should go to CSRB work group

Don't we have a CSRB science committee that handles studies for this species?

Subsurface wells investigation for habitat extent and impacts subsurface understanding where suggested during WG sessions

Why do w make the assumption that the CSRB are fragile and not able to handle low? They survived the drought of the 50's. We truly do not know near enough about the CSRB to make assumptions

Data analysis of regular monitoring and special study data could provide insights on survival of CSRB adults and larvae. "Experimental habitats" have limited potential in comparison to analysis of existing / forthcoming data.

All: What questions related to Issue 2 should the Work Group consider:

Mentimeter

I'm unclear on the sedimentation concern below 80cfs, since at those low flows it hasn't rained for a while and if it does won't there be a flushing effect?

Though I am supportive of shallow bio-wells investigations I would like to see some of the less invasive genetic or modeled habitat extent calculations of population before proceeding.

Unclear on the substrate survival concern for CSRB at low flows given survival for months during the drought of the 50's?

USFWS regs. require HCP and ITP's to include adaptive management processes. Is it fair to say or ask that studies on CSRB though being done may require time before AMP.

Public Comment

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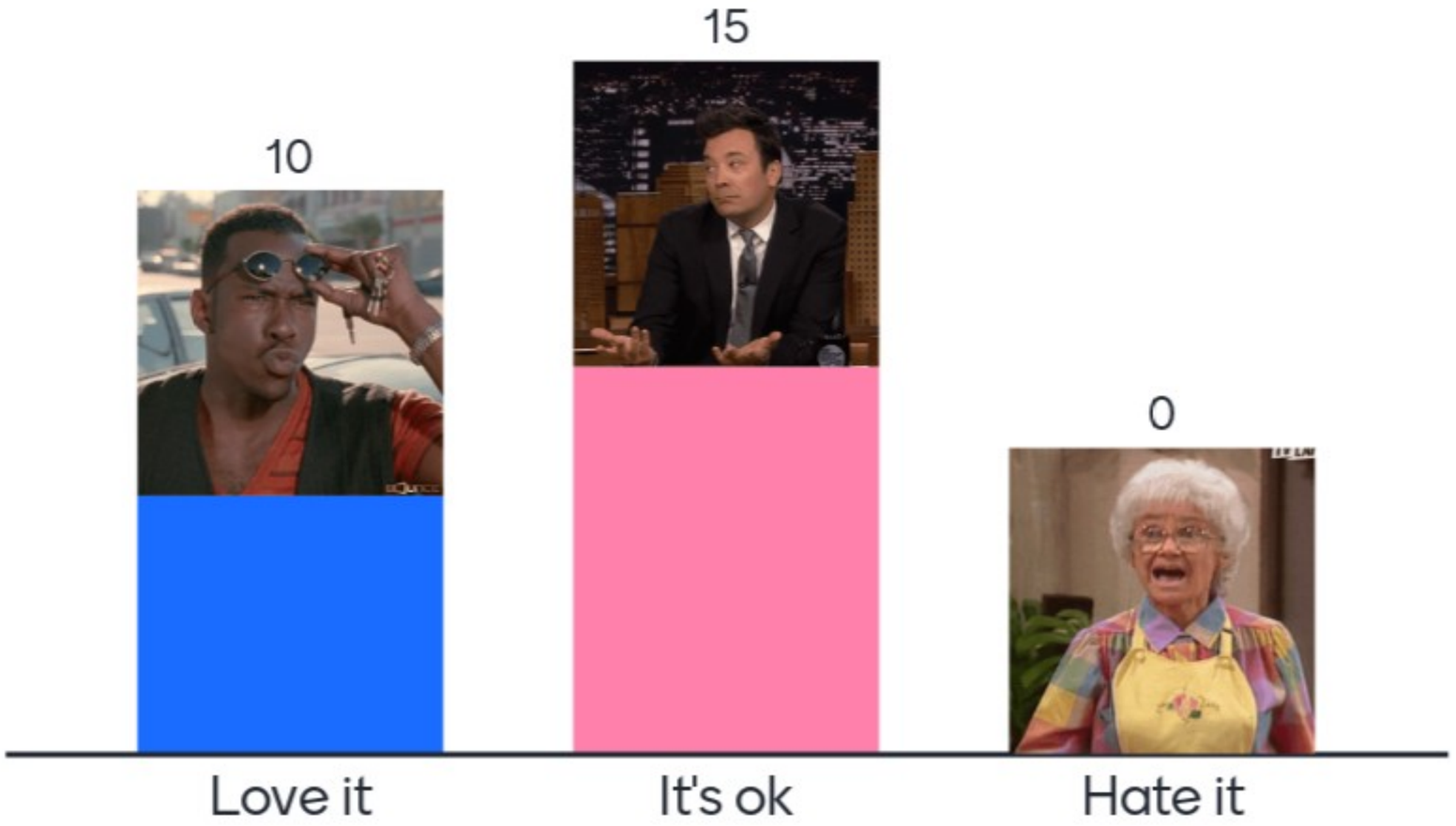
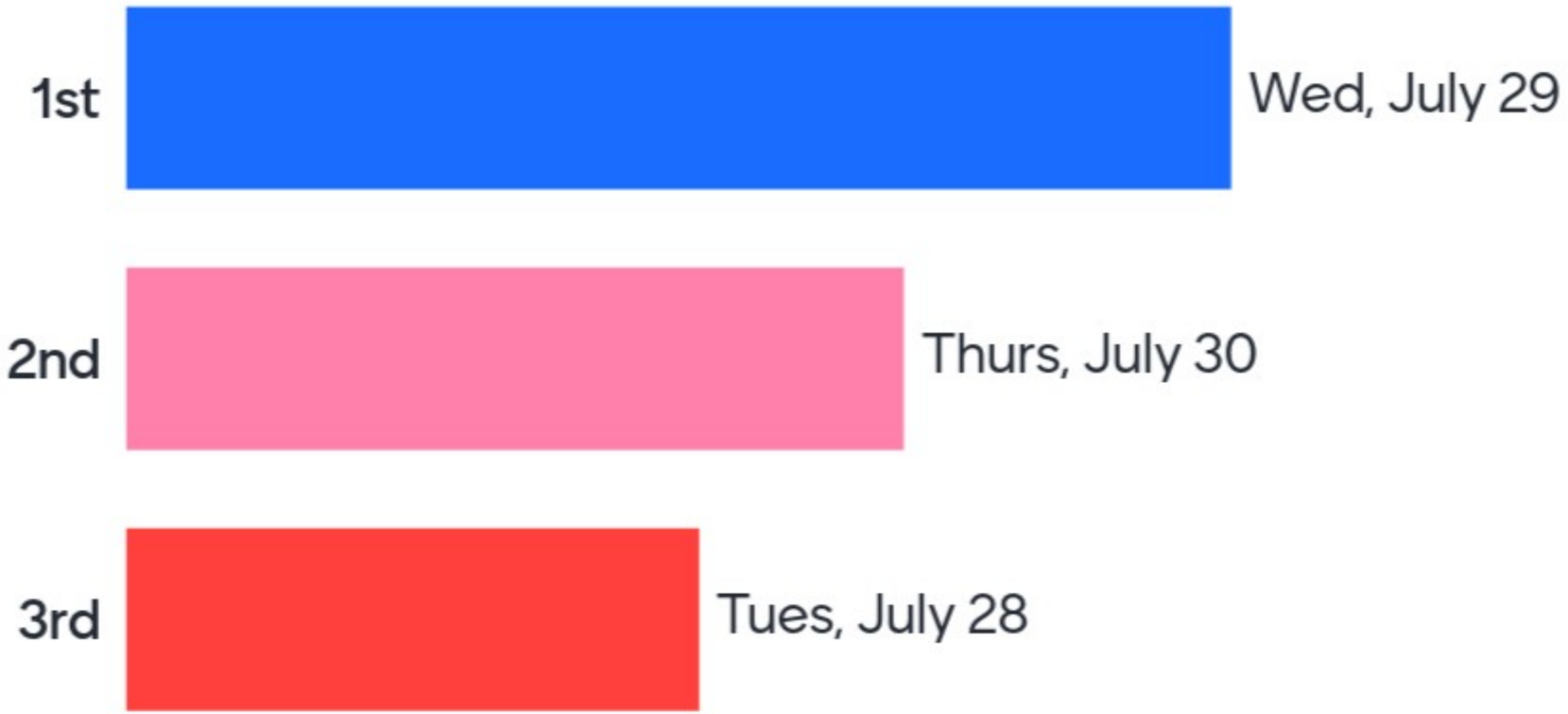
All: Was Menit helpful?

Mentimeter



WG: When should we have our next meeting?

Mentimeter



Thank you!

Anticipated next steps, starting today:

"Following the presentations, the Work Group will have an open discussion to inform the process of refining the set of questions and issues to be pursued, subject to approval by the Implementing Committee, as Part 2 of this charge." Work Group Charge p. 4.

"Part 1 is expected to result in a series of more-specific questions, as well scientific inquiries to identify knowledge gaps and recommended tools for filling those gaps, to be considered during Part 2, under the following general topics: (1) water quality impacts in both springs, (2) impacts on the Comal Springs riffle beetle populations, (3) impacts on San Marcos salamander populations, (4) impacts on Texas wild-rice and other vegetation serving as habitat for fountain darters, and (5) any relevant, specific adaptive management study commitments identified as meriting adjustment or further attention." Work Group Charge pp. 3-4.

Anticipated next steps, starting today:

Narrow the broad issues in current charge to more manageable questions regarding the potential adverse impacts of extended periods of low flow for further consideration.

Those more specific questions/issues presented to the Implementing Committee (IC) for review and consideration at its August 20th meeting.

Once the IC provides direction on specific questions, Work Group begins work, with assistance from EAHCP staff and contractors, on identifying data gaps and assessing tools (e.g. suggesting specific studies or analyses) for pursuing the questions/issues (Charge Part 2a)(Late 2021 completion).

Addressing data gaps and employing tools to come in Part 2b.

Two draft discussion documents intended to provide a possible place to start discussion

Document 1 sets out the four broad issues and examples of possible narrowing questions/issues (apologize for my communication failure, which resulting in some garbled phrasing of possible issues for discussion)

Document 2 is a version of the AMP study summary with examples of possible recommendations for next steps—don't intend to address today beyond overview

Issue 1. Water Quality
- Water temp in old channel
- DO levels in Landa Lake if vegetation dies

Issue 2. Comal Springs Riffle Beetle
- substrate
- subsurface survival
- sediment
- Tx State studies

Issue 3. SM salamander, TWR, FD habitat
- Sediment
- Water depth
- Recreation exclosures

Issue 4. AMP Study Commitments
- No issues
- Permit renewal
- WG Priority

Key to Proposed Work Group Recommendation Column Entries:

No obvious inconsistency with EAHCP study commitments: One or more studies have been done that address the referenced AMP commitment in a substantive way. The Work Group has not attempted to undertake a substantive review of study results, but, consistent with its understanding of the Work Group charge, has not identified an obvious shortcoming in addressing the AMP commitment and is not making a recommendation for further action. [Shown with green highlighting]

Key to Proposed Work Group Recommendation Column Entries:

Permit extension issue: Based on the Work Group review, this appears to be a study commitment that has not been addressed. Without making a judgment about the importance of the proposed study, the Work Group has identified an apparent shortcoming in addressing the AMP commitment and is recommending the Implementing Committee and EAHCP staff implement a process for addressing the apparent shortcoming in preparation for the anticipated renewal of the incidental take permit. In some instances, only a specific subset of the commitment is identified as an apparent shortcoming. [Shown with turquoise highlighting]

Key to Proposed Work Group Recommendation Column Entries:

Work Group Priority Subset: Based on the Work Group review, this appears to be a study commitment that has not been addressed. The Work Group has identified an apparent shortcoming in addressing the AMP commitment that merits further consideration by the Work Group in Part 2 of its charge. [Shown with red highlighting]

Example: **No obvious inconsistency with EAHCP study commitments entry**

M.·Another·critical·component·of·fountain·darter·habitat·that·is·presently·unknown·is·the·relationship·of·macroinvertebrates·(fountain·darter's·main·food·source)·to·low-flow·conditions.··Studies·will·be·designed·to·evaluate·the·simulated·effects·of·changing·water·quality·conditions·and·aquatic·vegetation·composition·on·the·macroinvertebrate·(mainly·amphipods)·community.·…·Similar·to·the·aquatic·vegetation·study,·not·only·will·simulated·impacts·be·assessed·during·extended·periods·of·simulated·low·flow,·but·recovery·following·these·periods·will·be·studied·to·learn·response·time·(amphipod·recovery)·following·a·severe·event.¤	Page·6-9¤	-Low-flow·food·source·threshold·study·(BIO-WEST·2013)¶ ¤	¤	No·obvious·inconsistency·with·EAHCP·study·commitments.¤

Example: Permit Extension Issue

D. Comal Springs Dryopid Beetle and Peck's Cave Amphipod: "As such, semiannual drift net sampling for both species will be continued in the context of the AMP during Phase I, and this additional data will be evaluated with the intent of establishing population metrics for these species for Phase II of the HCP."	Page 4-15	Semiannual drift net sampling has continued during Phase I for these species. No 'population metrics' have been established.		Permit extension issue for population metrics

Example: Work Group Priority Subset

O. Once a population is established in the experimental habitat, extended periods of low-flow will be tested to evaluate the effect of these periods on riffle beetle survival and habitat use. Surface habitat will be completely removed for extended periods of time, water quality will be altered to simulate extreme conditions, and other factors adjusted (e.g., reductions in leaf material or detritus, etc.) to simulate conditions that might be experienced in the wild during these conditions. As with other proposed Tier A efforts, recovery following impacts will also be investigated.	Pages 6-9 and 6-10	-Effect of low-flow on riffle beetle survival in laboratory conditions (BIO-WEST et al. 2014) -Determination of Limitations of Comal Springs Riffle Beetle Plastron Use During Low-Flow Study (Nowlin et al. 2014) -Comal Springs Riffle Beetle Habitat Connectivity Study (BIO-WEST and Texas State 2015) -Comal Springs riffle beetle occupancy modeling and population estimate within the		Work Group priority subset

Issue 1: *The Implementing Committee should ensure a technical evaluation is undertaken of water quality impacts of predicted extended periods of flow below 80 cfs in both spring systems, either using the Hardy water quality model but calibrated and validated using data from recent low-flow periods or using an alternate approach.*

***Potential water-quality-related topics under <u>Issue 1</u> for further Work Group consideration in Part 2 of process*:**

A. Evaluation of potential for low temperature springflow to bypass culverts connecting to the Old Channel during periods with flow below 80 cfs.
[*What are the minimum springflow temperatures that bypass culverts connecting to the Old Channel during periods with flow below 80 cfs?*]

B. Evaluation of potential for vegetation die-off during extended periods with flow below 80 cfs in the Comal Springs system, resulting in adverse impact on dissolved oxygen levels in spring runs and Landa Lake beyond the modeled results.
[*What is the effect on dissolved oxygen in spring runs and Landa Lake from vegetation die-off during extended periods (more than 6-months) with flow below 80 cfs in the Comal Springs system?*]

Issue 1: *The Implementing Committee should ensure a technical evaluation is undertaken of water quality impacts of predicted extended periods of flow below 80 cfs in both spring systems, either using the Hardy water quality model but calibrated and validated using data from recent low-flow periods or using an alternate approach.*

***Potential water-quality-related topics under <u>Issue 1</u> for further Work Group consideration in Part 2 of process*:**

Other questions:

C.

D.

E.

Issue 2: The Implementing Committee should ensure a technical evaluation is undertaken of potential impacts of predicted extended periods of flow below 80 cfs on Comal Springs riffle beetle populations

Potential Comal Springs Riffle Beetle topics under <u>Issue 2</u> for further Work Group consideration in Part 2 of process:

A. Investigation of substrate below key spring runs as it relates to potential for CSRB to retreat below surface during extended periods with flow below 80 cfs in the Comal Springs system.
[*Does the substrate below key spring runs allow for CSRB to retreat below the substrate surface during extended periods (6-months) with flow below 80 cfs in the Comal Springs system?]*

B. Investigation of potential for CSRB adults and larvae to survive subsurface, assuming availability of acceptable substrate, during extended periods with flow below 80 cfs in the Comal Springs system.
[*Can CSRB adults and larvae survive subsurface during extended periods (6-months) with flow below 80 cfs in the Comal Springs system?*]

Issue 2: The Implementing Committee should ensure a technical evaluation is undertaken of potential impacts of predicted extended periods of flow below 80 cfs on Comal Springs riffle beetle populations

Potential Comal Springs Riffle Beetle topics under <u>Issue 2</u> for further Work Group consideration in Part 2 of process (cont.):

C. Assessment of potential sedimentation issues in spring-run habitat and western shoreline area during extended periods of flow below 80 cfs in the Comal Springs system.
[*Does sedimentation in CSRB spring-run and western shoreline habitats negatively impact the survival of CSRB during extended periods of flow below 80 cfs in the Comal Springs system?*]

D. In recognition of ongoing studies at Texas State University regarding CSRB population estimates and genetics, the Work Group will assess the results of those studies, expected to be available later this year or next, to determine if specific additional study topics, or variations on topics A-C immediately above and on topics 4.O. and 4.R. below, are indicated to improve the understanding of potential impacts to CSRB during prolonged periods of flow below 80 cfs.
[*In recognition of ongoing studies at Texas State University regarding CSRB population estimates and genetics, additional study topics, or variations on topics A-C immediately above and on topics 4.O. and 4.R. below, may need to be addressed by the Comal Springs Riffle Beetle Work Group related to improving the understanding of potential impacts to CSRB during prolonged periods of flow below 80 cfs*.]

O.·Once·a·population·is·established·in·the·experimental·habitat,·extended·periods·of·low-flow·will·be·tested·to·evaluate·the·effect·of·these·periods·on·riffle·beetle·survival·and·habitat·use.··Surface·habitat·will·be·completely·removed·for·extended·periods·of·time,·water·quality·will·be·altered·to·simulate·extreme·conditions,·and·other·factors·adjusted·(e.g.,·reductions·in·leaf·material·or·detritus,·etc.)·to·simulate·conditions·that·might·be·experienced·in·the·wild·during·these·conditions.·As·with·other·proposed·Tier·A·efforts,·recovery·following·impacts·will·also·be·investigated.¤

R·A·series·of·low-flow·experiments·with·various·timing·and·durations·will·be·evaluated·while·examining·direct·impacts·to·Comal·Springs·riffle·beetles.··A·core·question·is:·when·are·reproduction·and·survival·compromised·as·physical·habitat·(surface·and·subsurface)·declines·and·water·quality·deteriorates?··The·reproduction·component·assumes·that·a·reproducing·population·can·be·established·in·the·study·habitat·during·Phase·I.···If·a·reproducing·population·is·successfully·established,·this·flow·manipulation·research·could·be·expanded·to·include·evaluation·of·desirable·and·threshold·environmental·conditions·for·larval·and·pupae·stages.¤

Issue 2: The Implementing Committee should ensure a technical evaluation is undertaken of potential impacts of predicted extended periods of flow below 80 cfs on Comal Springs riffle beetle populations

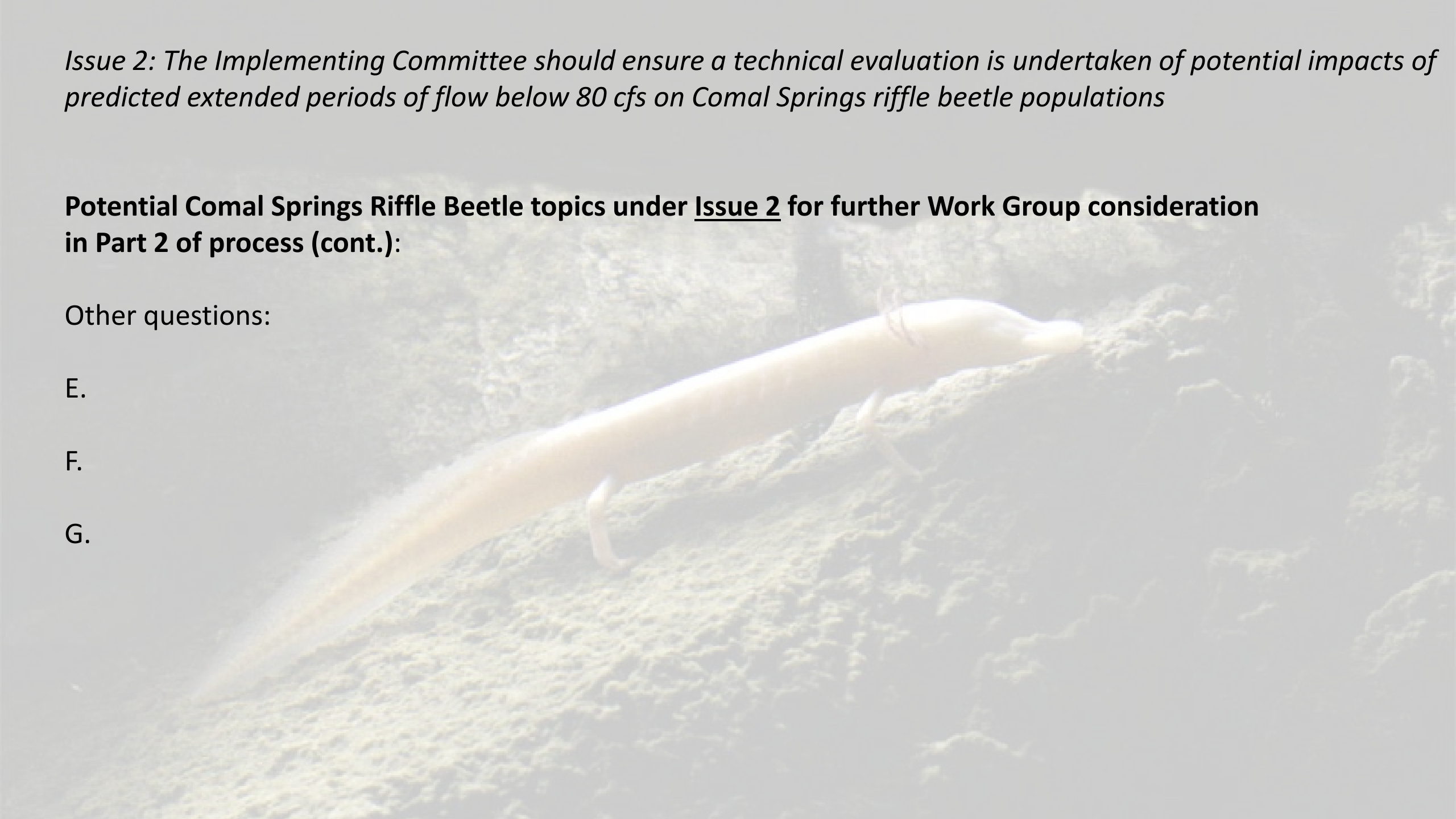
Potential Comal Springs Riffle Beetle topics under Issue 2 for further Work Group consideration in Part 2 of process (cont.):

Other questions:

E.

F.

G.



Issue 3 :The Implementing Committee should ensure that a technical evaluation is undertaken of potential impacts of predicted extended periods of flow below 80 cfs on San Marcos salamander populations, particularly for populations in the area below Spring Lake dam, and on Texas wild-rice and other vegetation serving as habitat for fountain darters downstream of Spring Lake dam, including consideration of impacts from recreation

Potential topics related to San Marcos salamander, Texas wild-rice, and vegetation serving as habitat for fountain darters in the San Marcos system under Issue 3 for further Work Group consideration in Part 2 of process:

A. Assessment of potential for problematic sediment accumulation in key habitat areas for San Marcos salamander (area around spring emergences and downstream of eastern spillway) during periods of low flow.
[*Is sediment accumulation negatively impacting key habitat areas for San Marcos salamander (around spring emergences and downstream of the eastern spillway) during extended periods (6-months) of low-flow below 80 cfs?*]

B. Evaluation of vulnerability to recreation impacts of Texas wild-rice and other vegetation serving as habitat for fountain darters and San Marcos salamanders, in areas downstream of Spring Lake during periods with flows below 80 cfs with a focus on water depth at various predicted flow levels.
[*Are Texas wild-rice and other vegetation serving as habitat for fountain darters and San Marcos salamanders vulnerable to recreation, in areas downstream of Spring Lake during periods with extended low-flow below 80 cfs?*]

Issue 3 :The Implementing Committee should ensure that a technical evaluation is undertaken of potential impacts of predicted extended periods of flow below 80 cfs on San Marcos salamander populations, particularly for populations in the area below Spring Lake dam, and on Texas wild-rice and other vegetation serving as habitat for fountain darters downstream of Spring Lake dam, including consideration of impacts from recreation

Potential topics related to San Marcos salamander, Texas wild-rice, and vegetation serving as habitat for fountain darters in the San Marcos system under Issue 3 for further Work Group consideration in Part 2 of process:

C. Consideration of development of an adaptive tool for identifying configurations of State Scientific Area exclosures to protect habitat areas with sufficient depth, identified pursuant to topic 3.B., in response to flow levels, particularly during periods with flow below 80 cfs, in order to minimize adverse impacts to Texas wild-rice and other fountain darter habitat while maintaining reasonable recreational access and realistic potential for implementation.
[*How should State Scientific Area exclosures be configured to protect habitat areas with sufficient depth, identified pursuant to topic 3.B., in response to extended periods of low-flow below 80 cfs, in order to minimize adverse impacts to Texas wild-rice and other fountain darter habitat while maintaining reasonable recreational access and realistic potential for implementation?*]

Issue 3 :The Implementing Committee should ensure that a technical evaluation is undertaken of potential impacts of predicted extended periods of flow below 80 cfs on San Marcos salamander populations, particularly for populations in the area below Spring Lake dam, and on Texas wild-rice and other vegetation serving as habitat for fountain darters downstream of Spring Lake dam, including consideration of impacts from recreation

Potential topics related to San Marcos salamander, Texas wild-rice, and vegetation serving as habitat for fountain darters in the San Marcos system under Issue 3 for further Work Group consideration in Part 2 of process:

Other Issues:

D.

E.

F.