



NON-LEVEE EMBANKMENTS (NLEs)



Presentation and Round Table Discussion

Thanks for Coming





NON-LEVEE EMBANKMENTS (NLEs)

Presentation and Round Table Discussion

2009 CASFM Annual Conference

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NON-LEVEE EMBANKMENTS (NLEs)

Panel Presenters:

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Guidelines for the Round Table Discussion :

- Questions after the slide show
- Remain objective
- Formulate questions, not solutions
- Keep discussion at policy level (hi-altitude)

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Why should I care about NLEs?

- **Comm. Officials** – NLE regulations are coming to your community
 - If you don't meet new requirements, FEMA may determine your floodplain limits for you
 - You may not be able to modify your flood maps without extra work at your community's cost
- **Consultants** – you will be certifying NLEs
 - Asked by clients to provide assurances against risk
 - Your stamp will be attached to NLEs



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Intro to NLEs – Definition

- What is a **Non-Levee Embankment (NLE)**?
 - Not a levee (*FEMA 2008*)
- Also Known As
 - Levee-Like Structure (*AZ, CO, MT*)
 - Flood Control Structure (*FHWA*)
 - Highways, railroads, canals, culverts, bridges
- Given an NLE is not a levee, let's review levees

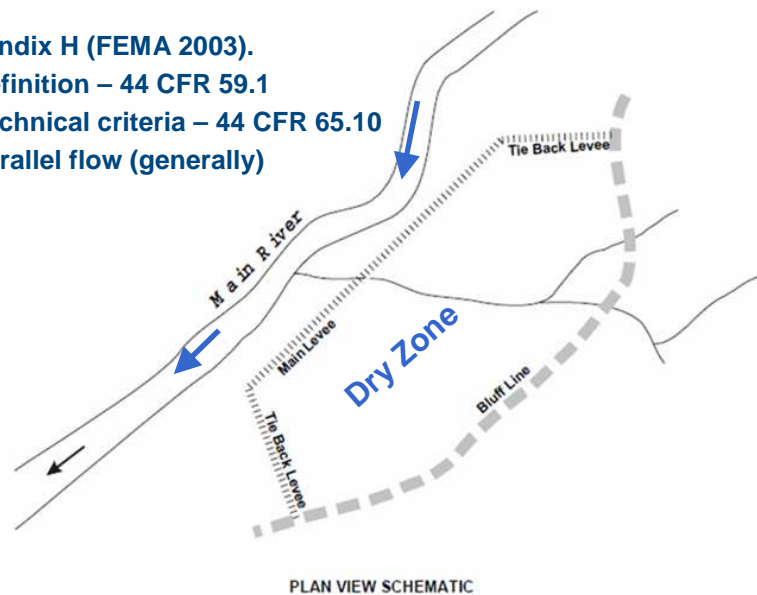


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Intro to NLEs – Classic Levees

Appendix H (FEMA 2003).

- Definition – 44 CFR 59.1
- Technical criteria – 44 CFR 65.10
- Parallel flow (generally)



Intro to NLEs – NOT Levees

- Unlike Levees, Non-Levee Embankments (NLEs) . . .
 - Are not defined in 44 CFR
 - Have no technical criteria
 - Can be oriented parallel or perpendicular to flow
 - May include ungated pipes and bridges

Intro to NLEs – Definition

- Best definition to-date:

A non-levee embankment (NLE) is any structure that provides protection from the 1%-annual-chance flood.

- Broad definition
- Let's try it out



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Levee or Non-Levee?



Levee or Non-Levee?



Levee or Non-Levee?



Levee or Non-Levee?



Levee or Non-Levee?



Levee or Non-Levee?



FEMA Region VIII

FEMA is introducing new NLE requirements

- **Intent** of new rules and regulations:
 - Protect life safety and property from flood hazards
 - Map an accurate representation of risk on FIRMs
- **Execution** – current area of concern:
 - Map worst case of all possible scenarios
 - Prof. Engineers must provide new assurances against failure
 - Otherwise; LOMC / PMR / DFIRM may be **rejected**
 - No appeals, no variance, **no exceptions**
- How did we get here?



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Non-Levee Embankment History



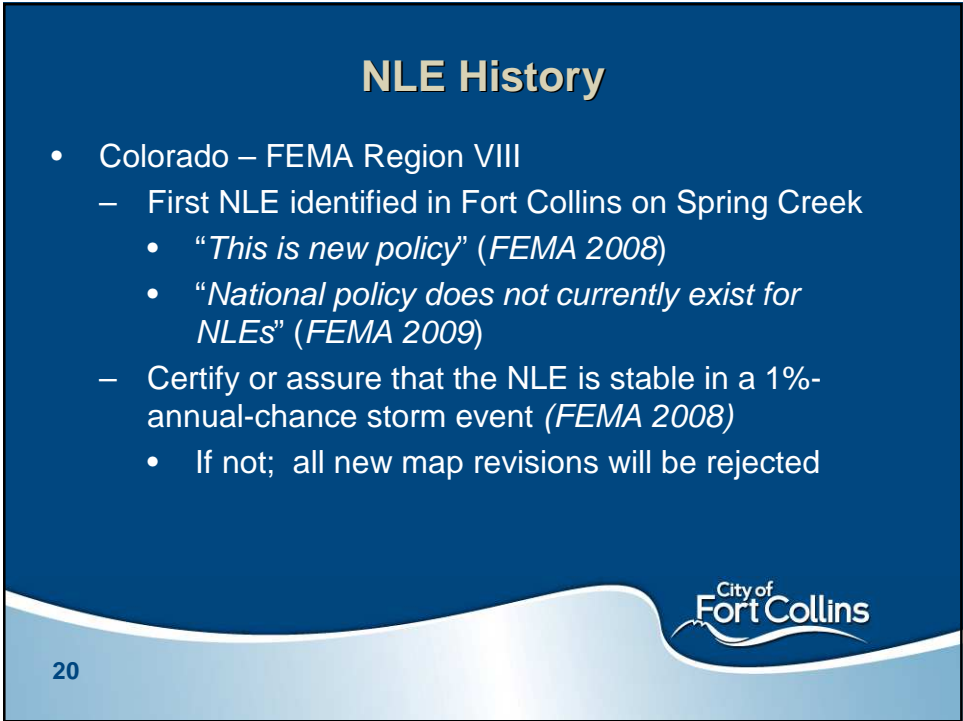
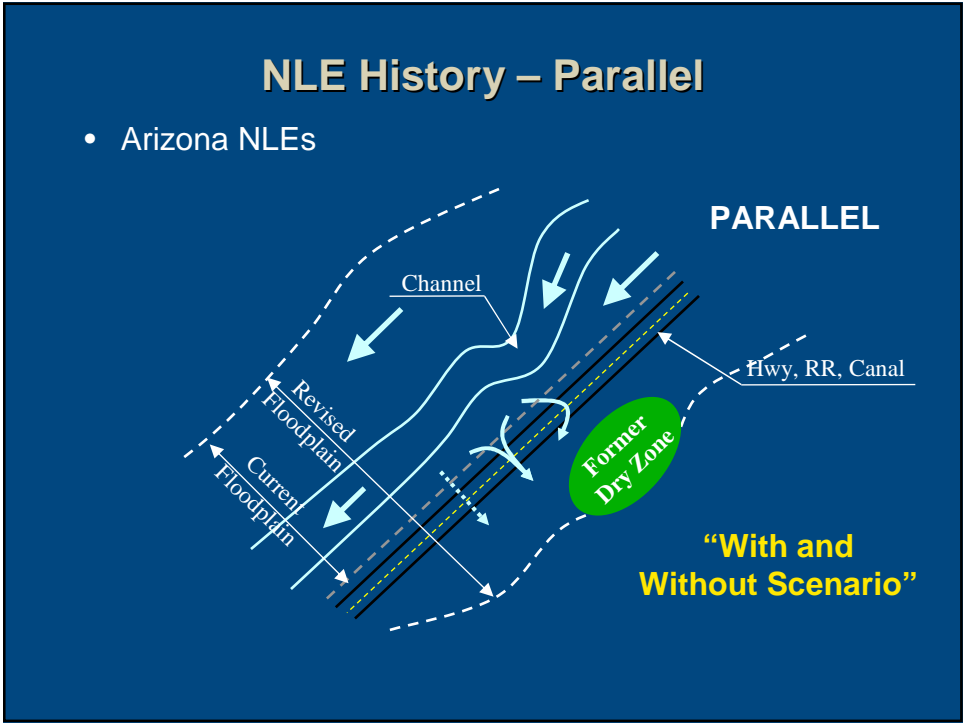
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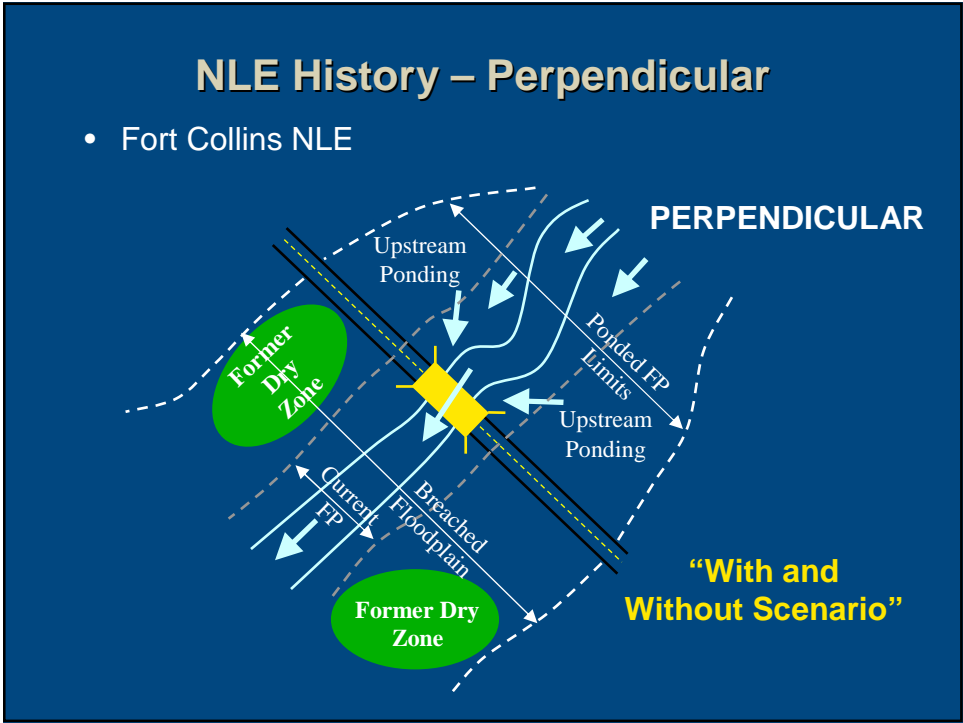
NLE History

- Arizona (2007) – FEMA Region IX
- First NLE identified in Marana, AZ (near Tucson)
 - Identified by FEMA during DFIRM
 - Floodplain area below NLE
 - Before NLE = 3 mi.² in Zone AE
 - After NLE = 19 mi.², Approx. Zone A
- Political gridlock, public outrage
- 7 community's DFIRMs and map updates still on hold



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NLE History

- Colorado (*cont'd*)
 - Requirement prior to remapping:
 1. Certify to 65.10-lite (*same as AZ*)
 2. Provide a letter of reasonable assurance against failure in 1% a.c. storm (*May '09*)
 3. or must Provide an accurate representation of risk in 1% a.c. storm (*Aug. '09*)
 - 2. **OK, back to reasonable assurance (*Sept. '09*)**
 - Montana has set a precedent

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NLE History

- Montana – FEMA Region VIII
 - NLE identified in Missoula County DFIRM
 - Irrigation or landscape berm, parallel to flow
 - Ponds less than 1.0-ft of water (not in SFHA)
 - Opted to provide a letter of reasonable assurance
 - Still shaded Zone X behind berm

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The logo for the City of Fort Collins, featuring the text "City of Fort Collins" in a serif font, with a stylized wave graphic underneath.

NON-LEVEE EMBANKMENTS

Mapping Non-Levee Embankments

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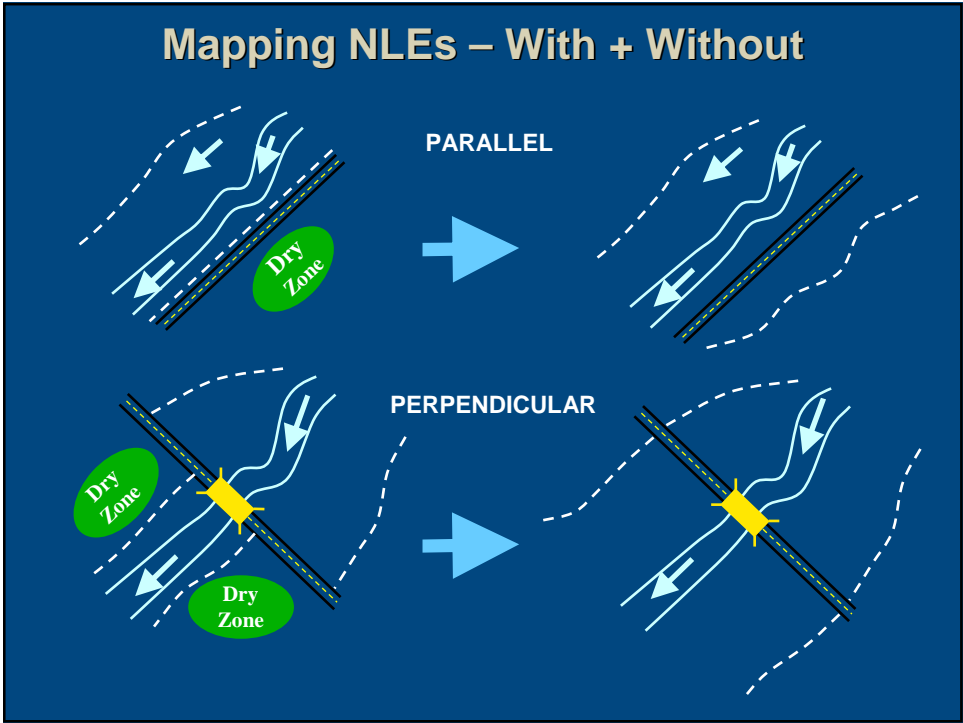
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Mapping NLEs – With + Without

- Recent decisions by FEMA (2007-08)
 - Bridges, culverts, and canal Xings are NLEs
 - The **with + without** scenario is the recommended method of recognizing NLE floodplain impacts
 - Floodplain + floodway limits will widen

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Mapping NLEs – Insurance

- Widening of floodplains results in . . .
 - More insurable property and structures in floodplain
 - Need for immediate public outreach
- Depending on the new flood zoning . . .
 - Insurance purchase might be mandatory
 - Premiums may be expensive
 - Now subjected to FP regulations



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Why should I care? – Insurance

- **Insurance Roadblock** – dry areas behind NLEs, though compliant with existing regulations, will be mapped in new flood zones on the FIRM.
 - Which zone? A-Zone? Residual risk zone?
 - Will flood insurance be mandatory?
 - This will cost someone some \$\$\$
 - Will grandfathered rates be available?



Why should I care? – Risk



- If insurance rates are based on risk . . .
. . . then what is the risk based on?
- **Risk Roadblock** – the with + without NLE mapping scenario is not a 1% annual chance on privately-maintained structures.
 - Can 1% ponding + 1% breach occur in same storm?
 - Dilemma of combined probability for flashy storms



Mapping NLEs – Case-By-Case

- FEMA will examine each NLE on a **case-by-case** basis
 - Regional Staff has decision-making authority
 - Can determine past decisions were wrong
 - Can reverse prior mapping decisions
 - i.e. – LOMCs, PMRs, DFIRMs
- No appeal, no variance, no exceptions
- The Fort Collins decision may ultimately set a precedent in Colorado



Why should I care? – Case-By-Case

- **Accurate Mapping Roadblock** – FEMA Region staff will determine what is an NLE + what is not.
 - Need **consistent** application of standards
 - **Subjective** based on staff input
 - Past decisions are not valid
 - Past practices not applicable
- **Applicability Roadblock** – every structure or feature is an NLE under current practice.
 - There is no 44 CFR definition for NLEs
 - No technical criteria exists for assurances



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Non-Levee Embankments; Policies + Technical Criteria

NLE Policies + Technical Criteria

- Current practice is difficult to enforce at all levels
 - If “national policy does not currently exist for NLEs” (FEMA 2009), and;
 - If national technical criteria does not exist (FEMA 2009), and;
 - If NLEs are not in existing regulations, then;
 - Requirements will not be applied uniformly
 - Requirements will be subject to appeal

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Why should I care? – Enforcement

- **Question of Enforceability** – how can non-policy-based regulations be enforced locally as a requirement of approval?
 - Asking administrators to enforce higher regulatory standards without code to back it up

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Mapping NLEs – Professionals

- Consultant's roles
 - Develop an accurate representation of risk
 - Help prepare reasonable assurance
- New requirements = new qualifications??
 - P.E., CFM, Structural Professional, Geotech. Professional

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Considerations for Professionals

- **Question of Qualifications**
 - What evidence must be prepared to support reasonable assurances?
 - Credentials to make that decision?



NLE Policies + Technical Criteria

- Reasonable Assurance letter requirement
 - Statement from a P.E. on 1%-annual-chance stability
 - How does this fit with the *Reasonably Safe From Flooding* statement on the MT-2 Form?
 - May be redundant
 - What is the professional liability?

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NLE Policies + Technical Criteria

- The MT-2 Form was acceptable in the past
 - LOMCs provide accurate representation of risk
 - H+H modeling
 - Text summary of assumptions and findings
 - Reasonably Safe From Flooding
 - 44 CFR 62.5(c) – community acknowledgement
 - Stamped by a Professional Engineer

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NLE Policies + Technical Criteria

- Ongoing challenges for other communities
 - Ownership, Operation + Maintenance of NLEs
 - Some NLEs are privately owned and maintained
 - Railroads
 - Canals, diversions
 - Landscape features
- **How can NLEs be recognized on maps?**
 - Owners may not want to get involved

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Effects of NLEs on Colorado Communities

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State and National Trends

- CWCB – updating CO Rules and Regulations
 - Statewide floodplain rules are being revised
 - Desire to complement FEMA policies where possible
 - Current rules on the books are silent on NLEs
 - No FEMA policy → threat of incompatibility

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Future of NLEs – Statewide

- State perspective
 - What prevents every culvert statewide from becoming an NLE?
 - Without a definition of NLEs, what prevents anything from becoming an NLE?
 - Significant increase in study and mapping costs
 - Recent studies are immediately obsolete
 - Significant cost and effort lost

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Future of NLEs – Statewide



- State perspective (*cont'd*)
 - Public outreach nightmare – mapping and insurance
 - Potential to eliminate quantifiable benefits from otherwise reasonable projects
 - Local officials left holding the bag
- **Firm policy + criteria is needed as a roadmap for consistent treatment for and definition of NLEs**



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ASFPM Input



- ASFPM
 - A definition of NLE is necessary
 - Early identification of NLEs in mapping process is necessary
 - Develop standards that can be applied consistently throughout all regions



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Roadblocks Summary

- **Insurance** – dry areas behind NLEs, though compliant with existing regulations, will be mapped in new flood zones on the FIRM (i.e. approx. A-Zones).
- **Risk** – is the with + without NLE mapping scenario still a 1% annual chance on privately-owned structure?
- **Accurate Mapping** – FEMA Reg'n. staff assessment will determine what is an NLE + what is not without the development of technical standards, regulations, and criteria

Questions Summary

- **Applicability Roadblock** – every structure or feature may be an NLE under current practice.
- **Enforceability** – how can non-policy based regulations be enforced locally as a requirement of approval?
- Who will **pay** for map updates where NLEs have been identified?
- What is missing on the MT-2 Forms?
- What exactly is FEMA trying to **achieve**?

Future of NLEs – Locally

Local Recommendation – **prepare your community**

- Watch your preliminary maps carefully
 - NLEs can show up without prior warning
- NLEs might get you mired in process
 - Provide info → get rejected → repeat
 - Same story in Arizona
- Ask Region VIII and Headquarters to involve locals, states, regions, and CTPs
 - We have to enforce → would like to be involved
 - Provide standards and criteria that we can administer



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Future of NLEs – Locally

Fort Collins perspective (1 of 2)

- We need minimum standards adopted in regulations
 - Save higher standards for the CRS
 - Take the time to do this right
- We need uniform standards we can apply to all situations and basins.
 - Case-by-case approach leaves room for non-uniform application of standards
- If something is missing on the MT-2 Form, can it be modified to address NLE issues?



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Future of NLEs – Locally

Fort Collins perspective (2 of 2)

- Fort Collins supports sound floodplain management through good governance practice
 - Must engage in public discussion
 - The current practice has not been vetted
- Model ordinance should be developed with FEMA, and:
 1. Technical advisory committees
 2. State Chapters (CASFM, AFMA, etc.)
 3. ASFPM leadership and resources
 4. Local offerings and involvement



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Action Items

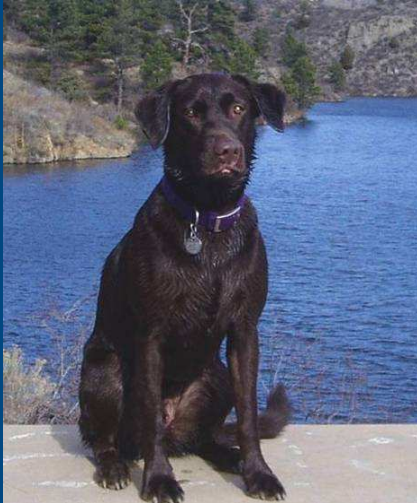
What can be done right now?

1. Find the NLEs in your community
2. If cooperating with FEMA on NLEs, keep your CTP in the loop during your case-by-case discussion
3. There is a wealth of information available to you
 - USE IT
4. Offer to help – there is expertise in this room
5. CML wants to help
 - Sam Mamet, 303-831-6411



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Thanks for
listening

**Open
Discussion**

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