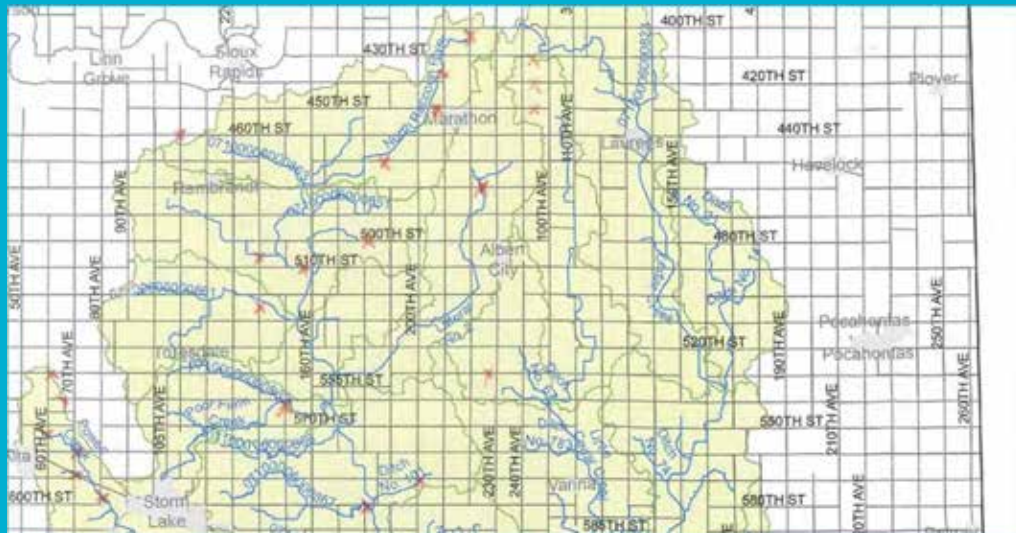


How to Aim Your Stones:

Identify areas of greatest flood damage

Identify and
estimate loss of
private
buildings due to
flooding

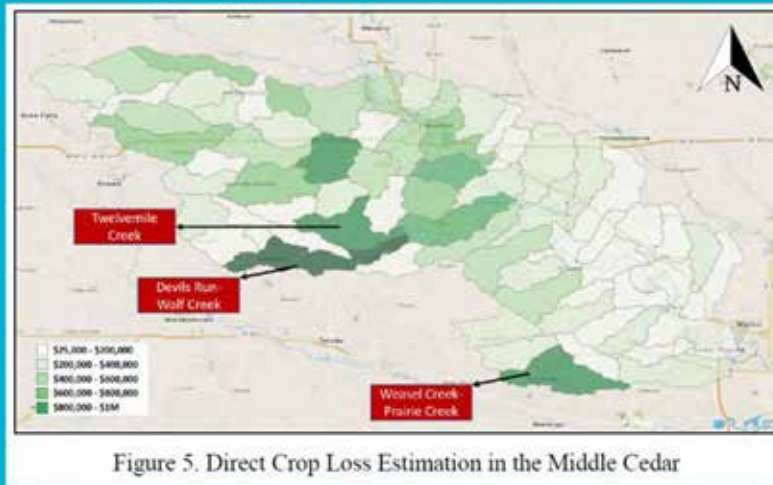
Identify oft-flooded bridges, roads,
trails and other critical (public) facilities



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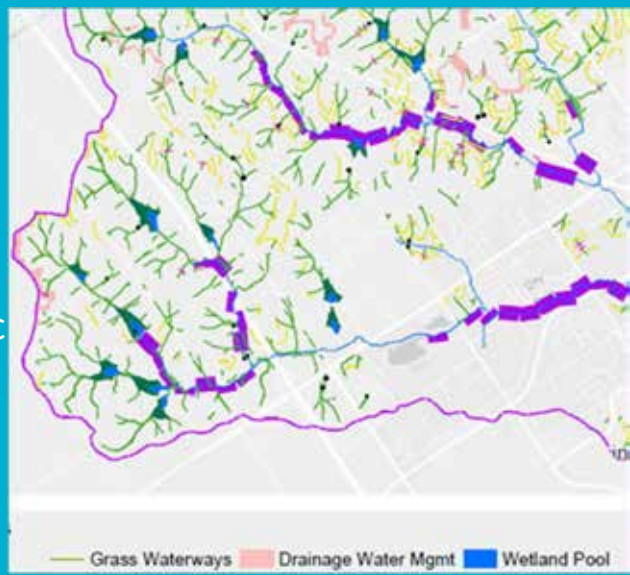
Identify areas of greatest flood damage

Go upstream from those areas to put practices

Identify Best Sites for practices (like Ponds, Wetlands, Detention)

To Identify Best Sites for Ponds/Wetlands/Detention

- 1) Agricultural Conservation Planning Framework (ACPF)
- 2) Areas of historic depressions (and oxbows)
- 3) Past flooded properties
- 4) Willing landowners/ Public Land



NOW you can hit two birds with one stone . . .

But, will the stone kill them, or just cripple?

- Need to find out how much flood reduction will come from practices
- To find out, must run a model that estimates:
 - **Flow reduction and**
 - **Resulting flood stage reduction**
 - **At identified areas of flood damage**

So you've found the right stone, you took proper aim, you have the right force to finish off the birds . .

.

But now, you find that dang stone is too heavy for you to pick up!
(i.e. it costs too much for you)

Go after FEMA Hazard Mitigation Assistance (HMA) or NRCS Watershed and Flood Prevention Operations (WFPO) funding

If you get the funding, you'll get a lot of help lifting that stone!

1. Only certain practices are suited for both
2. Only certain locations will result in both flood reduction & water quality improvement
- 3. Certain factors must be considered to be cost-effective and to get certain funding**

BCA Required for HMA or WFPO Funding

- To be funded, the Benefit:Cost Ratio (BCR) must be greater than 1.0
- The BCR is calculated through a Benefit Cost Analysis:

Benefit =

Flood Losses before putting in practices
MINUS

Flood Losses after putting in practices

Cost =

Installation PLUS operations & maintenance

BCA considers entire Project Useful Life (e.g. 30 years)

Ecosystem Benefits

- FEMA has determined that certain types of space have additional “ecosystem benefits” that can be added into a benefit cost analysis
- Before adding ecosystem benefits, the BCR must get to at least 0.75
- Then, the following additional benefits may be added (annually at discount rate):
 - Green open space created receives extra benefit of \$8208/acre
 - Riparian areas restored/created reaps benefit credit of \$39,535 an acre
 - Wetlands receive additional \$6010 an acre
 - Forest area receives extra benefit of \$554 an acre

Putting it all together: Putting in Practices to Reduce Flooding while Improving Water Quality

Steps to follow in order:

1. Identify areas of greatest flood damage
3. Identify best sites (upstream) for watershed approach practices
4. Determine flow reduction from practices
5. Determine flood depth reduction at damage locations
6. Determine new, reduced potential flood damage (after practices in place)
7. Estimate cost of practices (plus O & M)
9. Do a Benefit-Cost Analysis
10. Pull together funding for practices

Steps to fit in:

2. Local group with authorized representatives from jurisdictions take the lead
8. Find landowners willing to put in practices and projects

Mechanisms to Move Forward



Find and start with areas with greatest “POWAR”

Potential
Of using a
Watershed
Approach for
Reducing Floods

POWAR = $\frac{\$ \text{ Flood Damage}}{\text{Area Upstream}}$

Examples:	Decorah	Dyersville	Dunkerton	Sumner
Building Loss	\$5,204,944	\$4,132,327	\$843,495	\$109,013
Content Loss	\$2,245,117	\$1,677,718	\$355,331	\$45,472
Inventory Loss	\$76,314	\$212,689	\$55,981	\$83,606
Total Loss	\$7,526,375	\$6,022,734	\$1,254,807	\$238,091
Divided by				
Total Upstream Drainage Acres	304,988	75,476	63,120	30,820
= PoWAR	25	80	20	8

FEMA Hazard Mitigation Assistance (HMA)

- FEMA HMA includes BRIC, HMGP & FMA
- Grant Administered by HSEMD
- HMA does not pay for cover crops; only long-term projects
- FEMA HMA: 75% Federal, 10% state
- Remaining 15% must be “Non-Federal” match; can be in-kind
- 5% can go to project management:

Sub-applicant/sponsor may request up to 5% of total as reimbursement for project management (thus could help pay expenses of watershed coordinator)

NRCS Watershed and Flood Prevention Operations (WFPO)

- WFPO also known as PL-566
- Must complete Watershed Plan-EA before applying for funds for construction
- WFPO pays 100% of construction costs, but no \$ for land
- Local entities responsible to acquire/secure land

State and Private Assistance?

- With HMA's 15% local match requirement - what's incentive for one jurisdiction to fund projects that benefit another jurisdiction?
- With WFPO, no funds for land - but farm owners want compensation for land

So?

State of Iowa (not federal) funding?

Iowa Natural Heritage Foundation

The Nature Conservancy?

Iowa Ag Water Alliance?

May require looking at adding this to priorities

Or new State fund? Targeted at projects doing both WQI & FR

Some day?

Currently, CDBG-DR and a few other federal grants CAN be used as “Non-federal” match for other federal programs.

Perhaps some day could manage to change law so other federal grants could be used as “non-Federal” match when doing both water quality improvement and flood reduction

On the watershed
Get used to a country mile
When you're learning to face
The path at your pace
Every choice is worth your while

From the song *Watershed* by Indigo Girls



On the watershed

Every choice is worth your while



On the watershed . . .

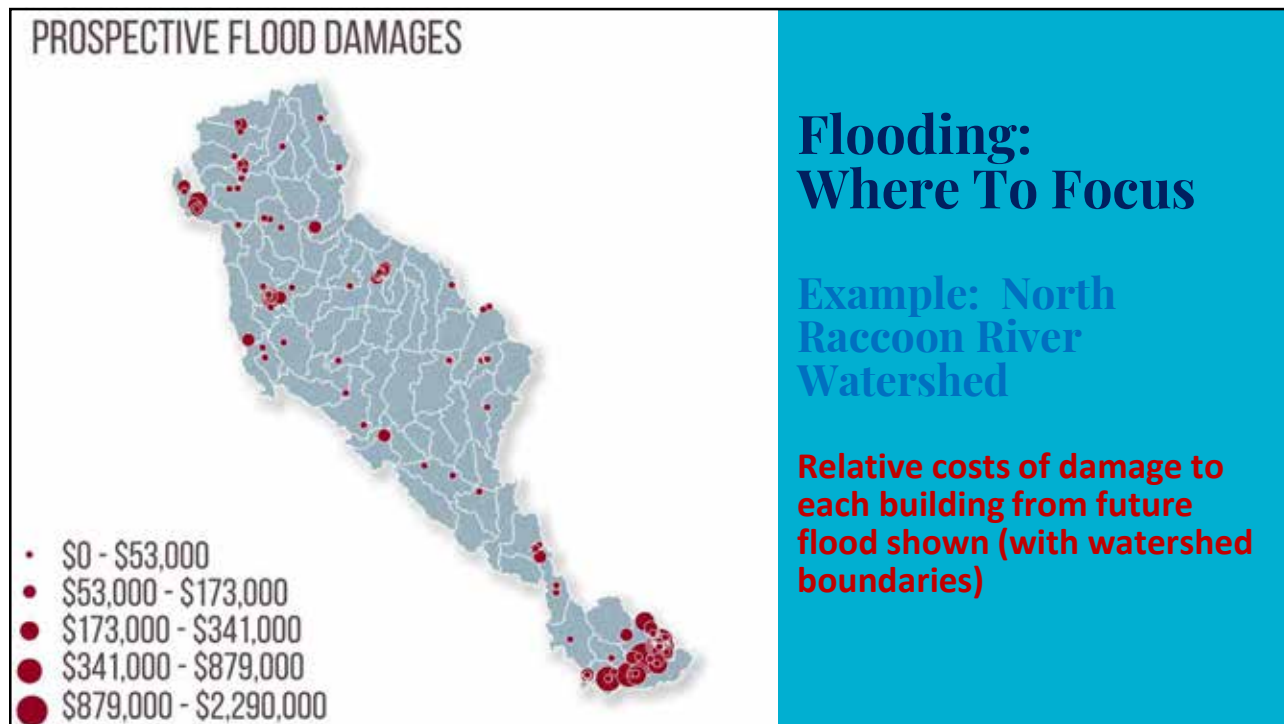
Every choice is worth your while



*Jim Marwedel, State Hazard Mitigation Planner
Iowa Homeland Security and Emergency Management
jim.marwedel@iowa.gov*

Why Watershed Approach Flood Reduction?

- **Flood mitigation with regional impact:**
 - Reduce impact to not just one jurisdiction, but to every place downstream
- **Potential with each project to build on itself:**
 - Start at headwaters, reducing flood levels and flow. Then, downstream do not have to do as much to lower flood levels to prevent significant impacts (peak flows and subsequent impacts are reduced incrementally)
- **More sustainable:**
 - Working with nature and reducing maintenance requirements
- **Reduce costs of flood damage**
- **Nutrient reduction along with flood reduction**
- **Flood mitigation and nutrient reduction that likely would not have been done**



Flooding: Where To Focus

Example: North Raccoon River Watershed

Relative costs of damage to each building from future flood shown (with watershed boundaries)

Significant estimated damage from 2% flood event

Estimated Loss from 2% Flood Event (50 year flood)			
HUC 12	Building Damage	Content Damage	Combined Loss
70600030708	\$ 51,251	\$ 16,342	\$ 67,593
70600050101	\$ 164,973	\$ 131,597	\$ 296,570
70600050102	\$ 256,292	\$ 93,497	\$ 349,789
70600050202	\$ 212,410	\$ 190,388	\$ 402,798
70600060501	-	-	-
70600060502	\$ 28,258	\$ 15,662	\$ 43,921
70600060503	-	-	-
70600060601	\$ 961,435	\$ 292,532	\$ 1,253,967
70600060602	\$ 938,078	\$ 275,873	\$ 1,213,957
70600060603	\$ 1,751,590	\$ 953,131	\$ 2,704,721

The map displays the Dyersville area with flood zones for different return periods. The 100-year flood zone (red outline) is the largest, covering the majority of the area. The 50-year flood zone (purple outline) is nested within it. The 20-year flood zone (blue outline) is the smallest. The city of Dyersville is marked with a yellow star. The map also shows the city of Valdese and the city of Dyersville, City of, AA. The legend indicates that the blue outline represents the 20-year flood zone, the purple outline represents the 50-year flood zone, and the red outline represents the 100-year flood zone. The map also shows the city of Dyersville, City of, AA, and the city of Valdese.

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