

**Electronically Filed
FIRST CIRCUIT
1CCV-20-0001541
08-JAN-2021
12:49 PM
Dkt. 138 CROA**

DOCUMENT 52

EXHIBIT D-2

2018 CWRM D&O Amended interim
instream flow standards in the East Maui
License Area

Ayron Strauch, Hydrologist
Stream Protection and Management Branch



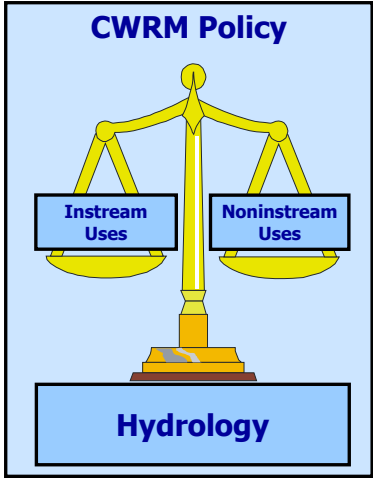
1. Overview of IIFS Process
2. East Maui Geology and Hydrology
3. Instream Uses
4. 2018 CWRM Decision & Order
5. Non-instream uses



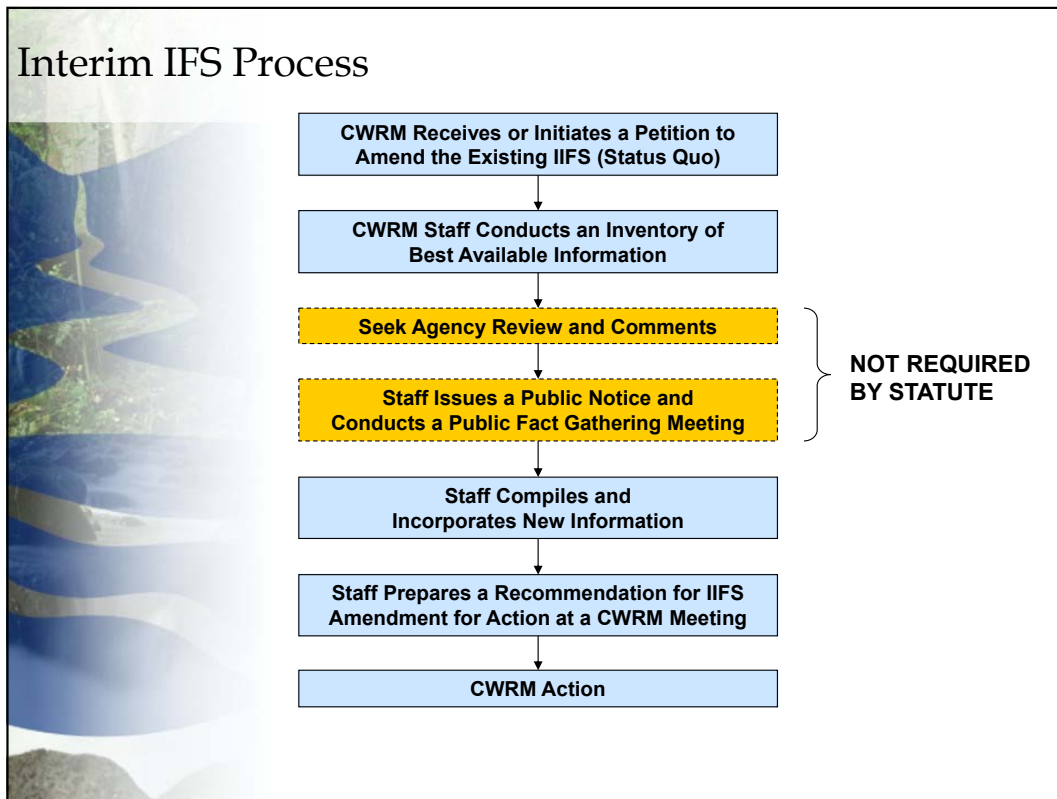
SLIDE 2 of 39

State Water Code HRS 174C

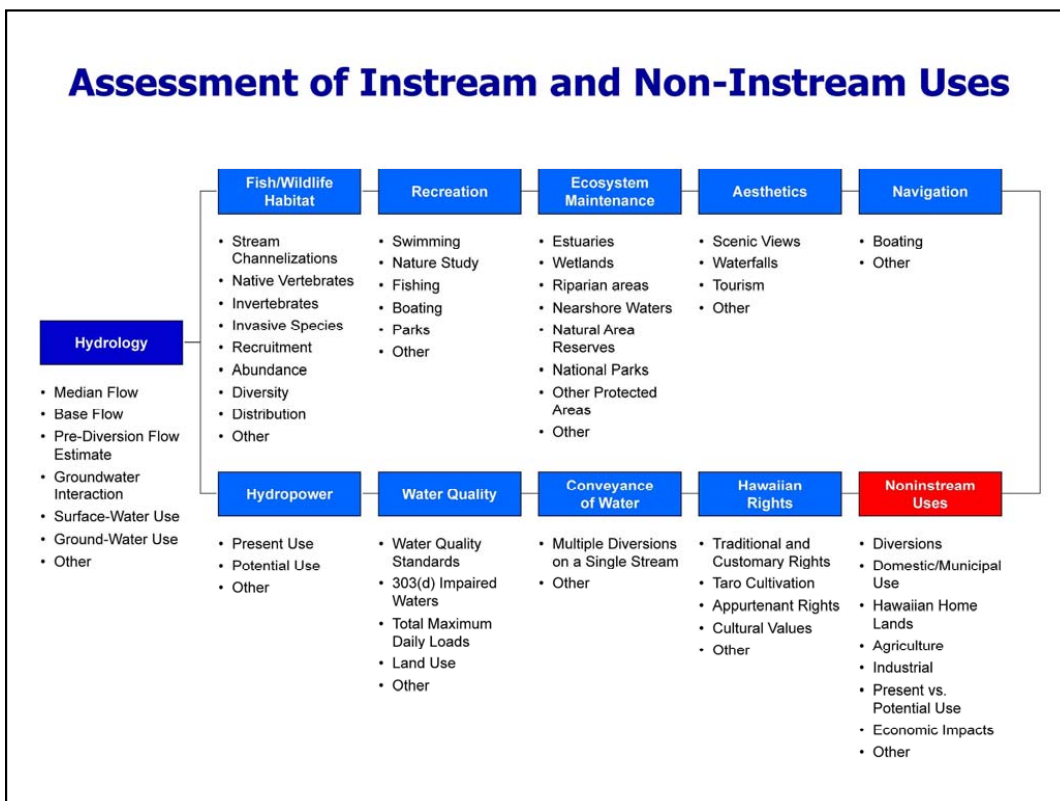
“The Commission shall weigh the importance of the present or potential instream values with the importance of present or potential uses of water for nonstream purposes, including the economic impact of restricting such uses.”



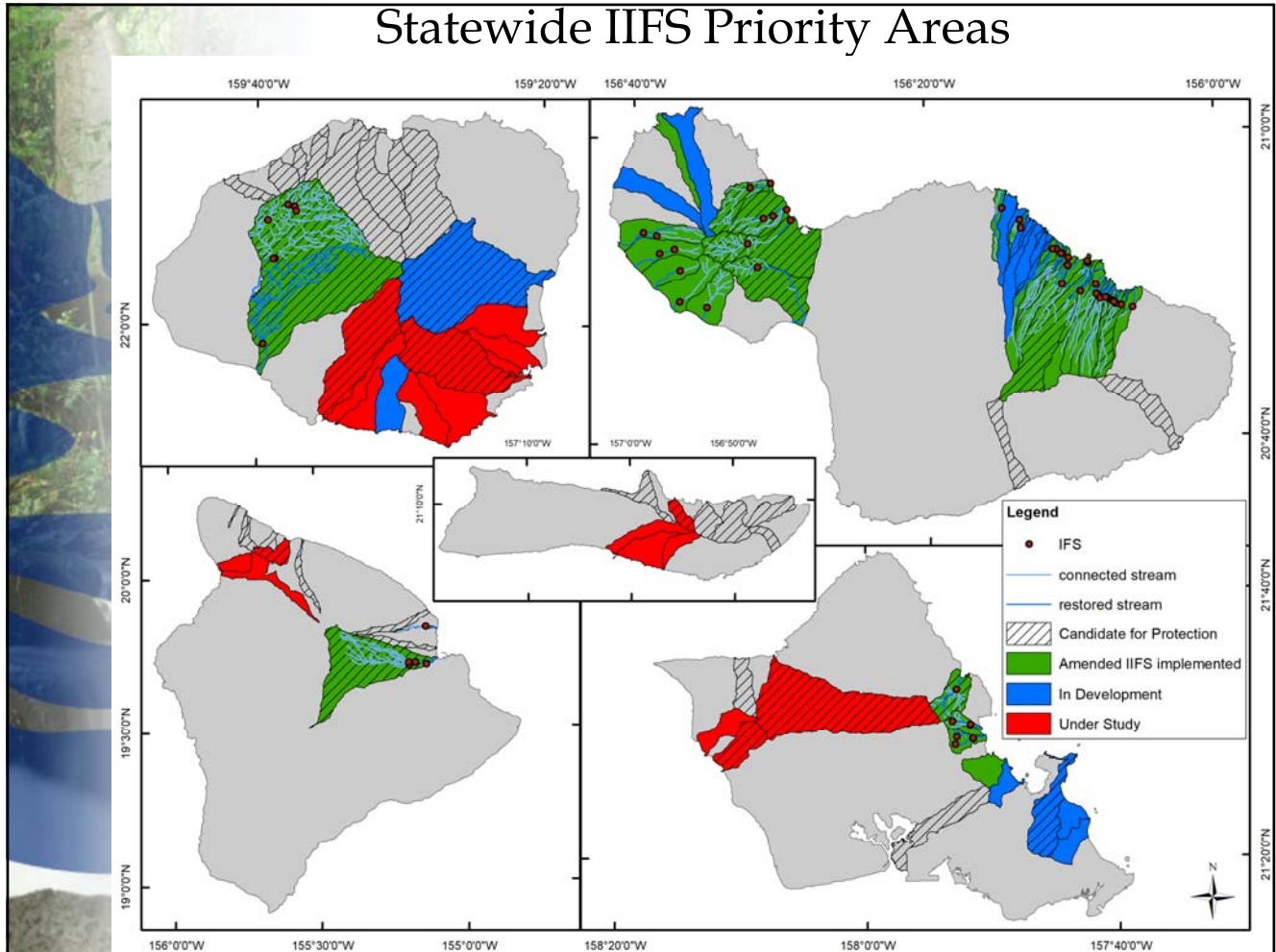
SLIDE 3 of 39

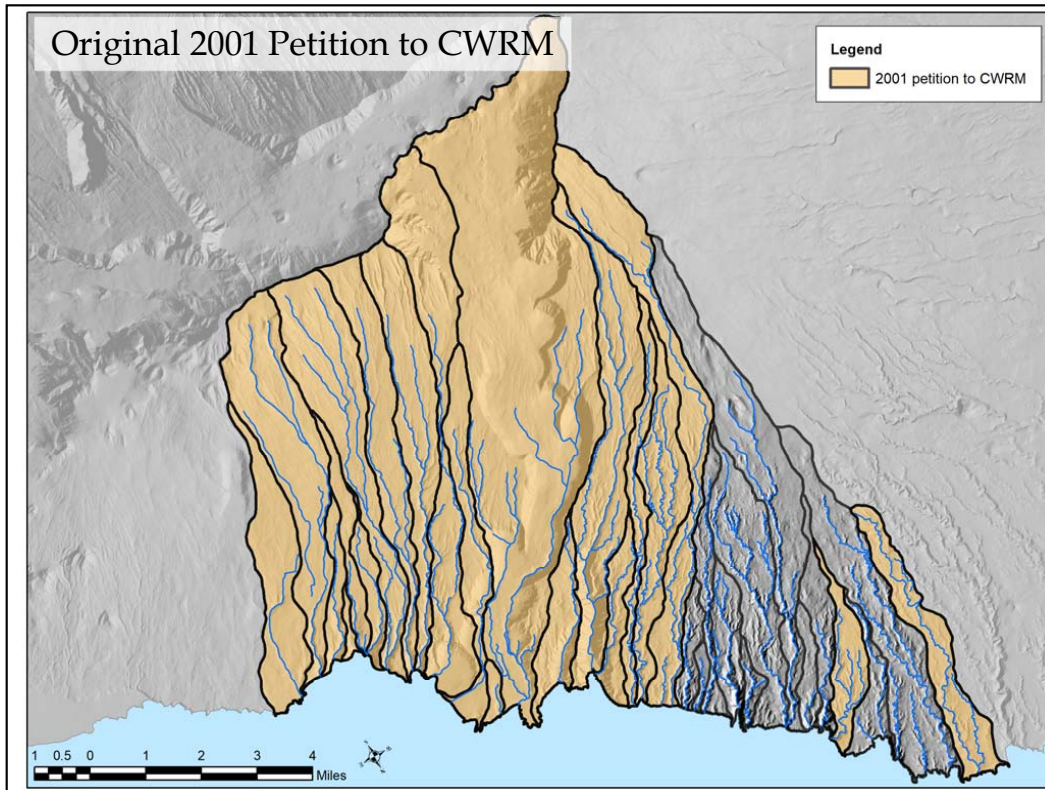


SLIDE 4 of 39

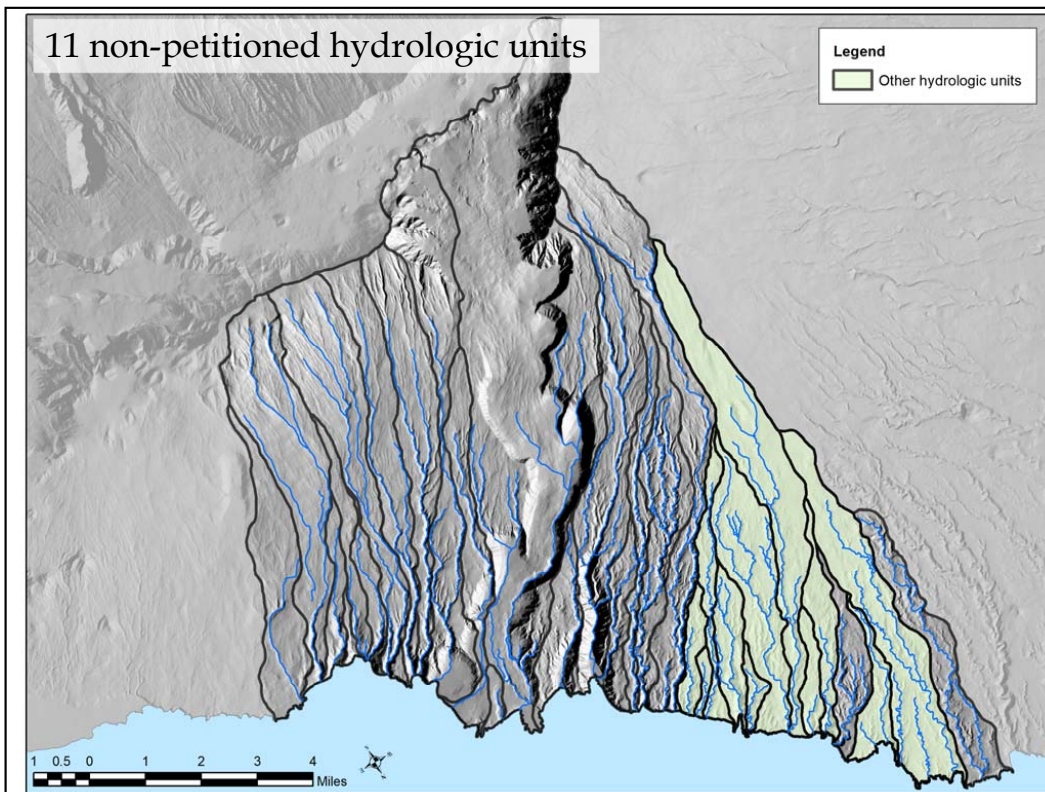


SLIDE 5 of 39

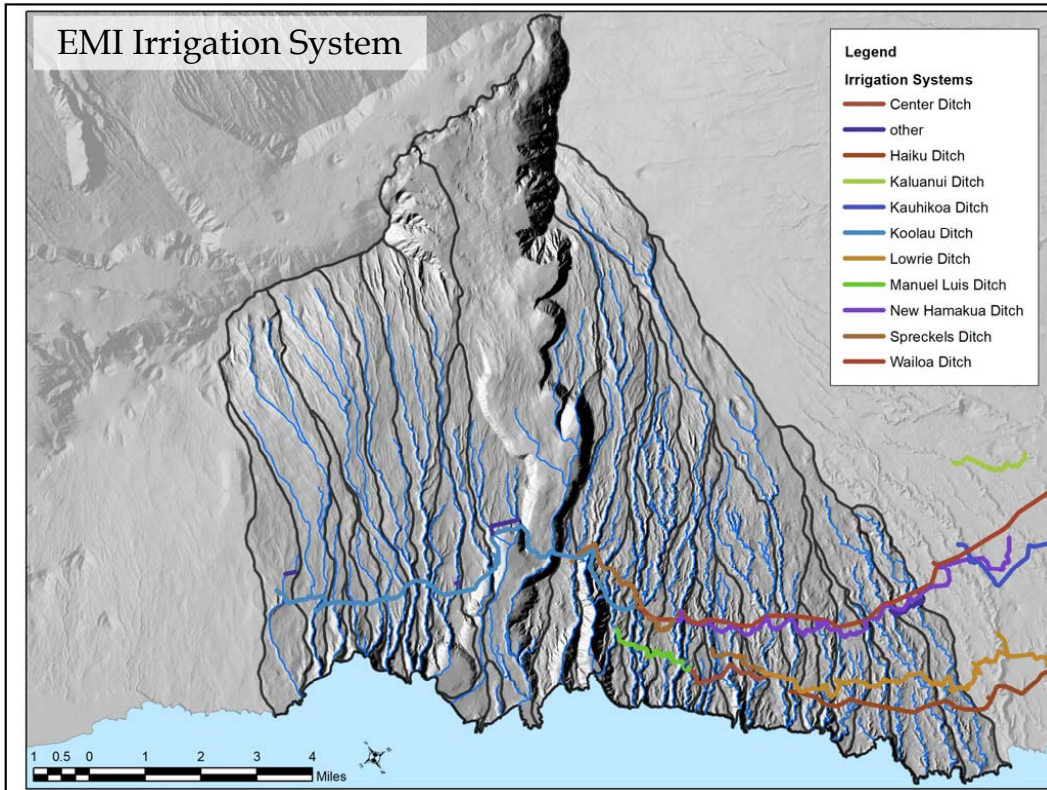




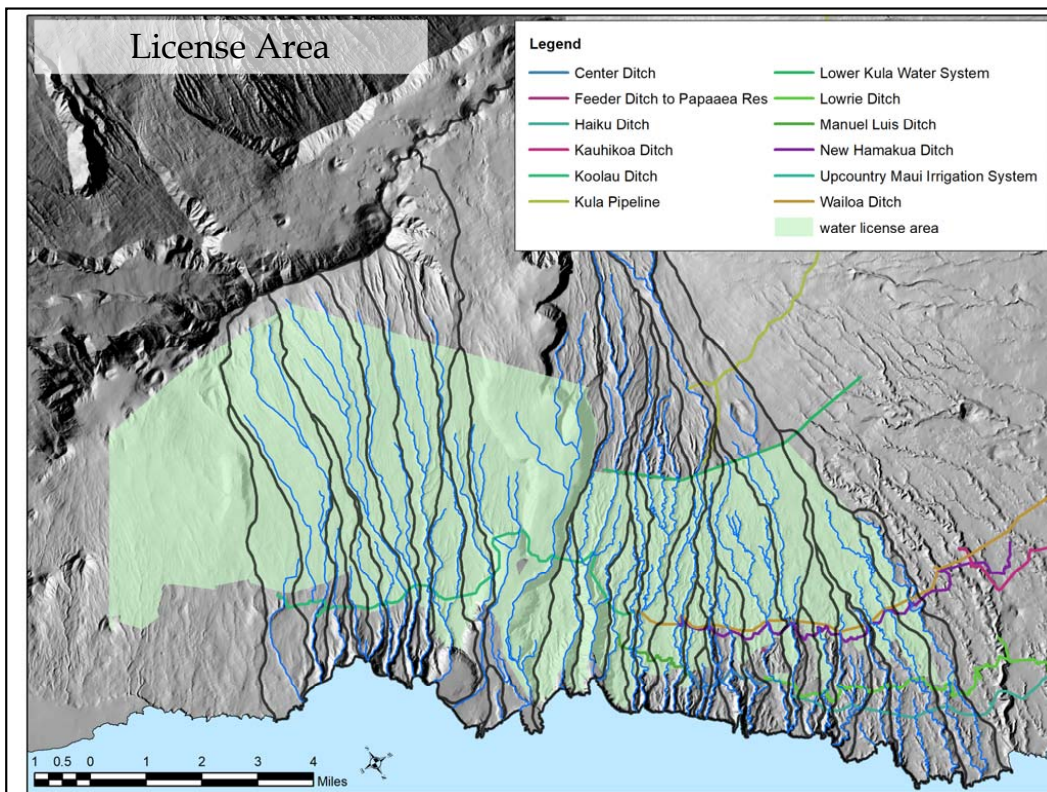
SLIDE 7 of 39



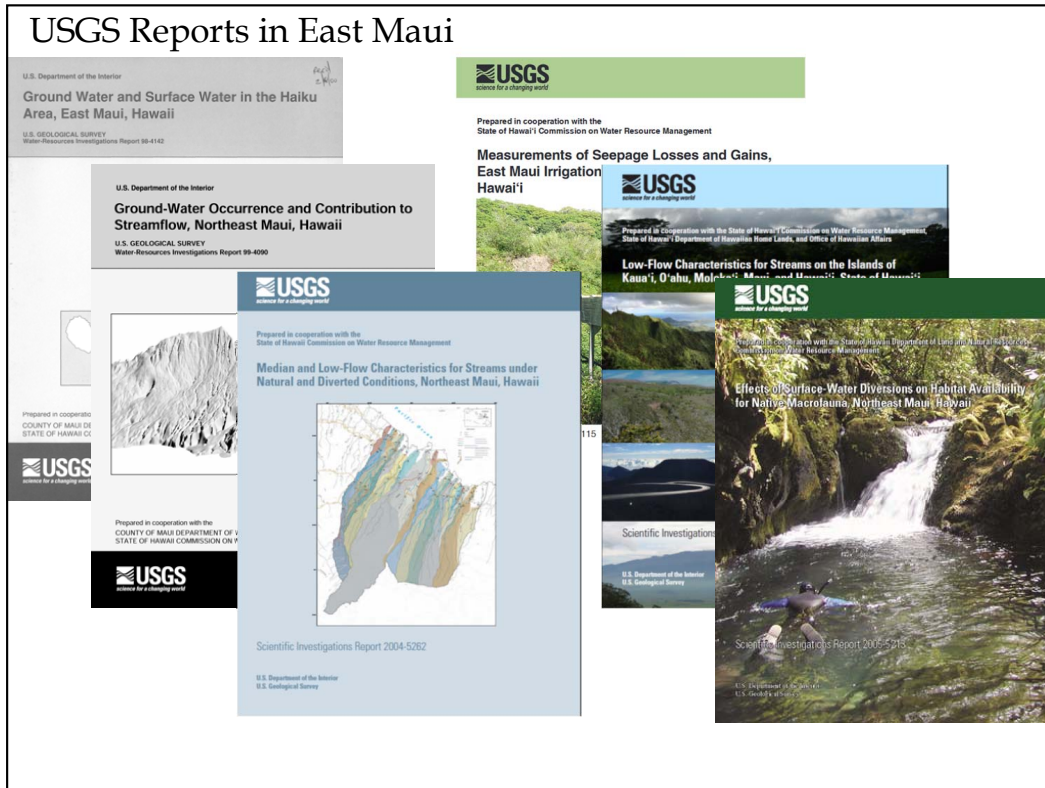
SLIDE 8 of 39



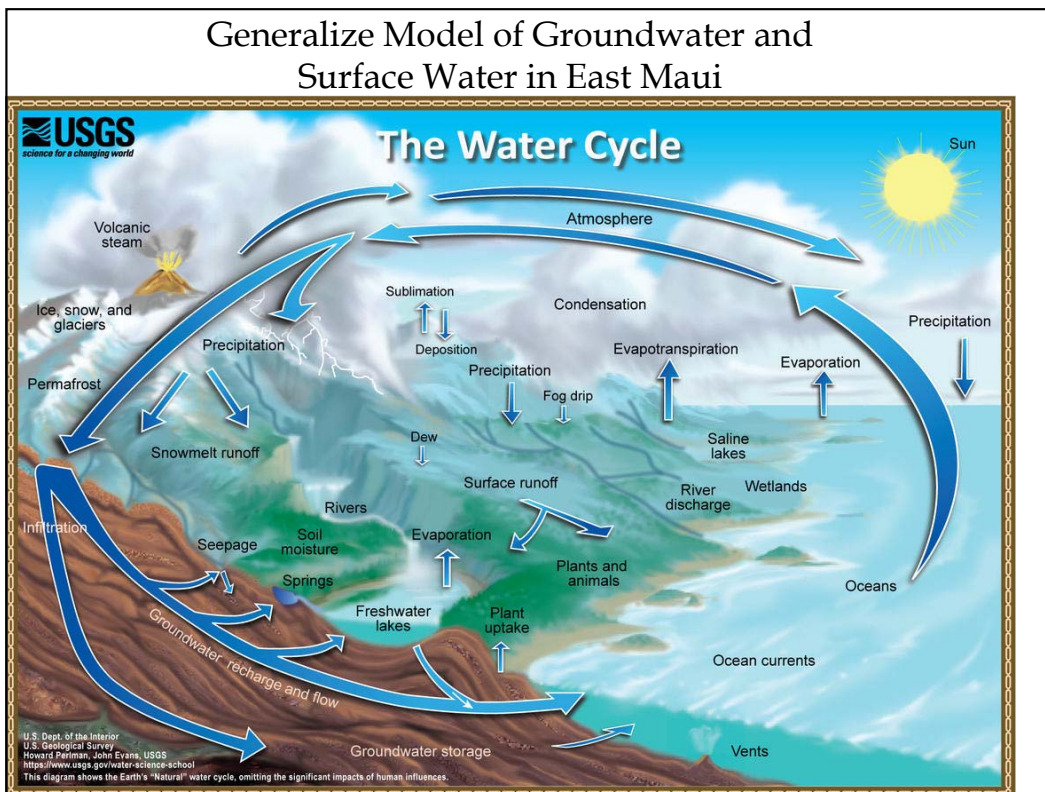
SLIDE 9 of 39



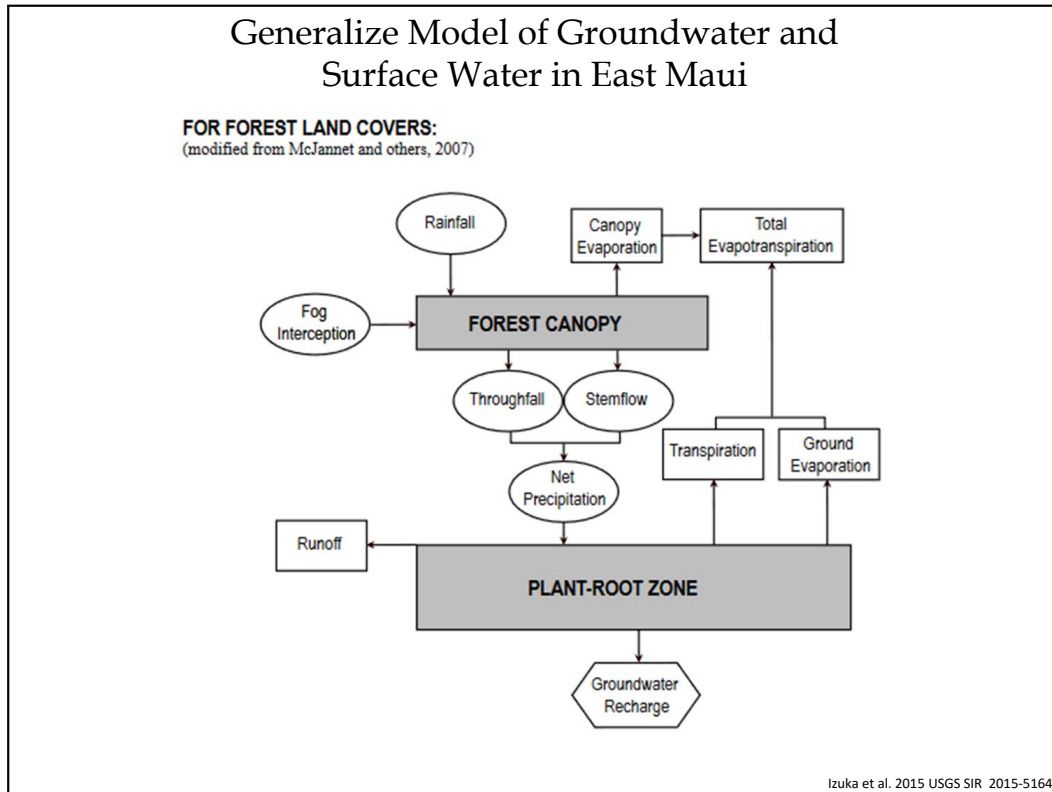
SLIDE 10 of 39



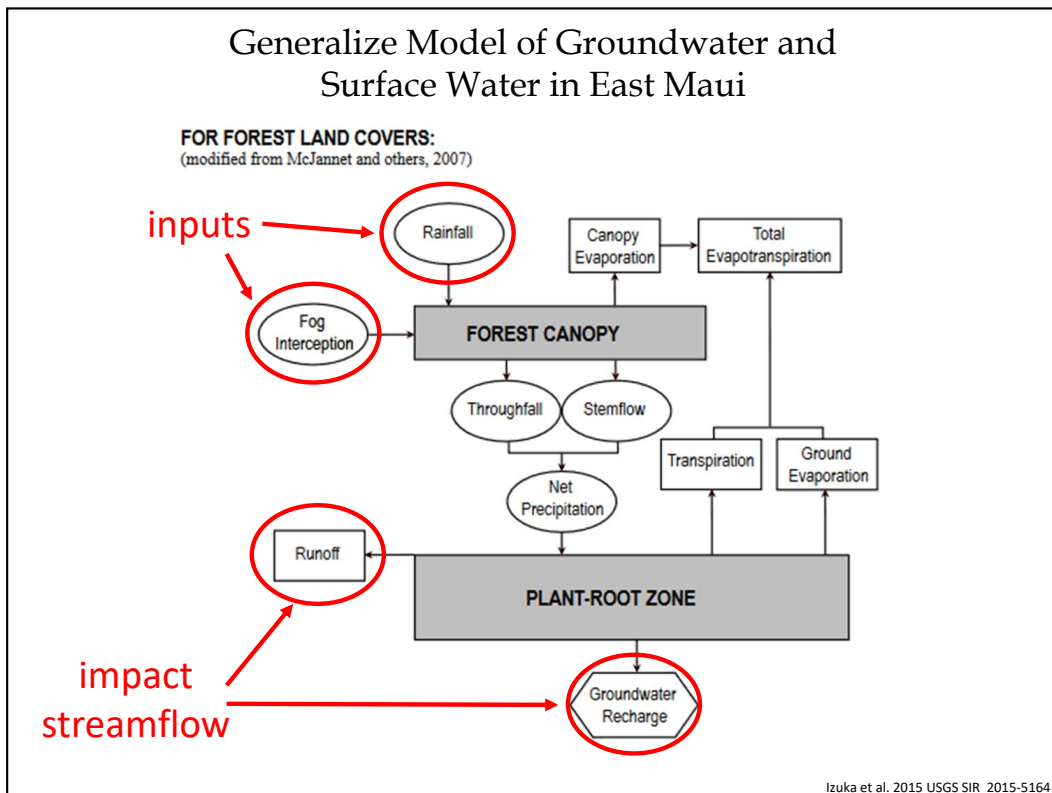
SLIDE 11 of 39



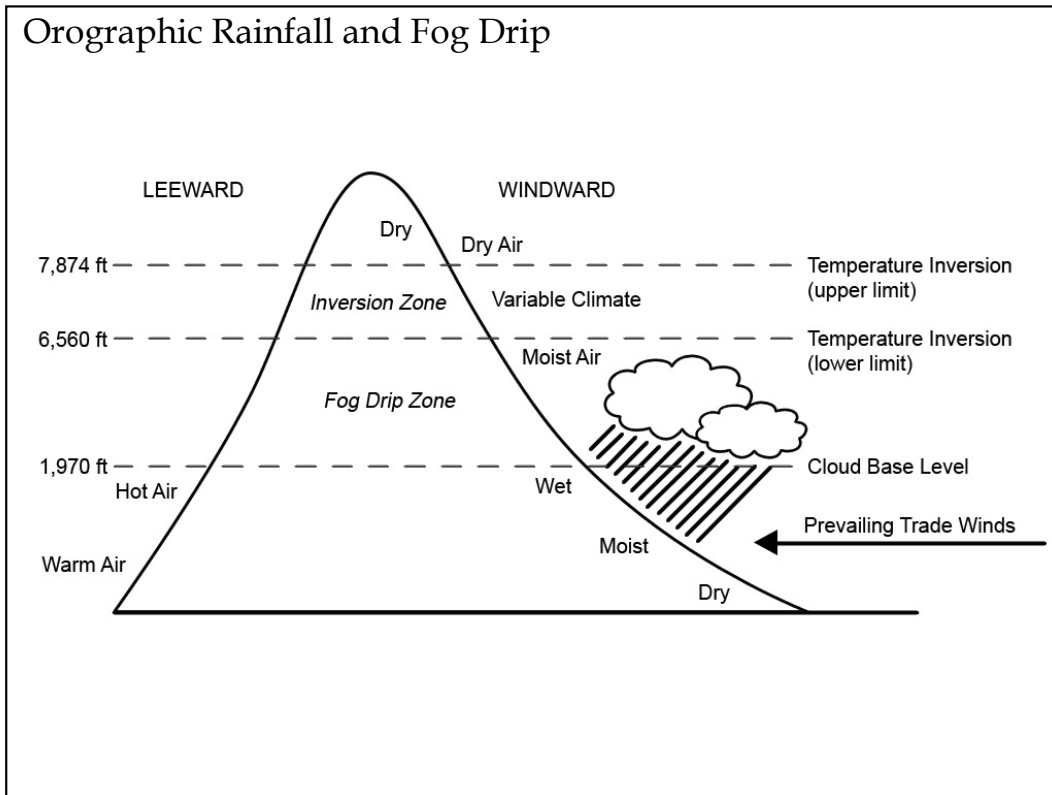
SLIDE 12 of 39



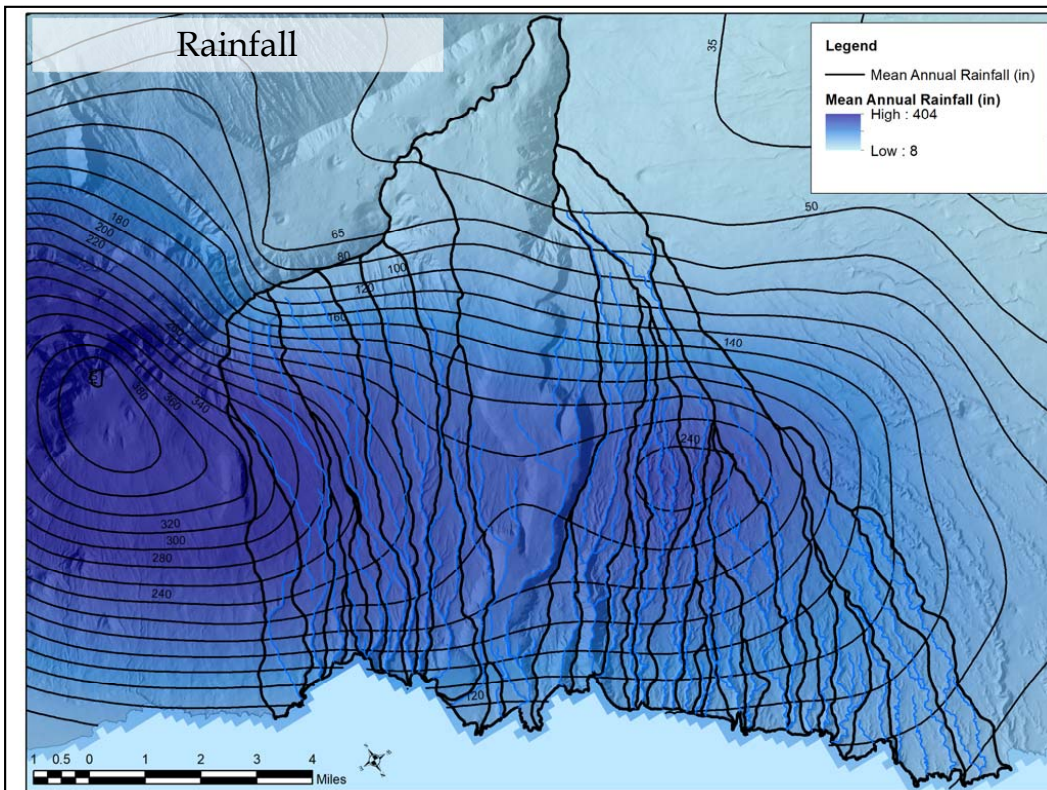
SLIDE 13 of 39



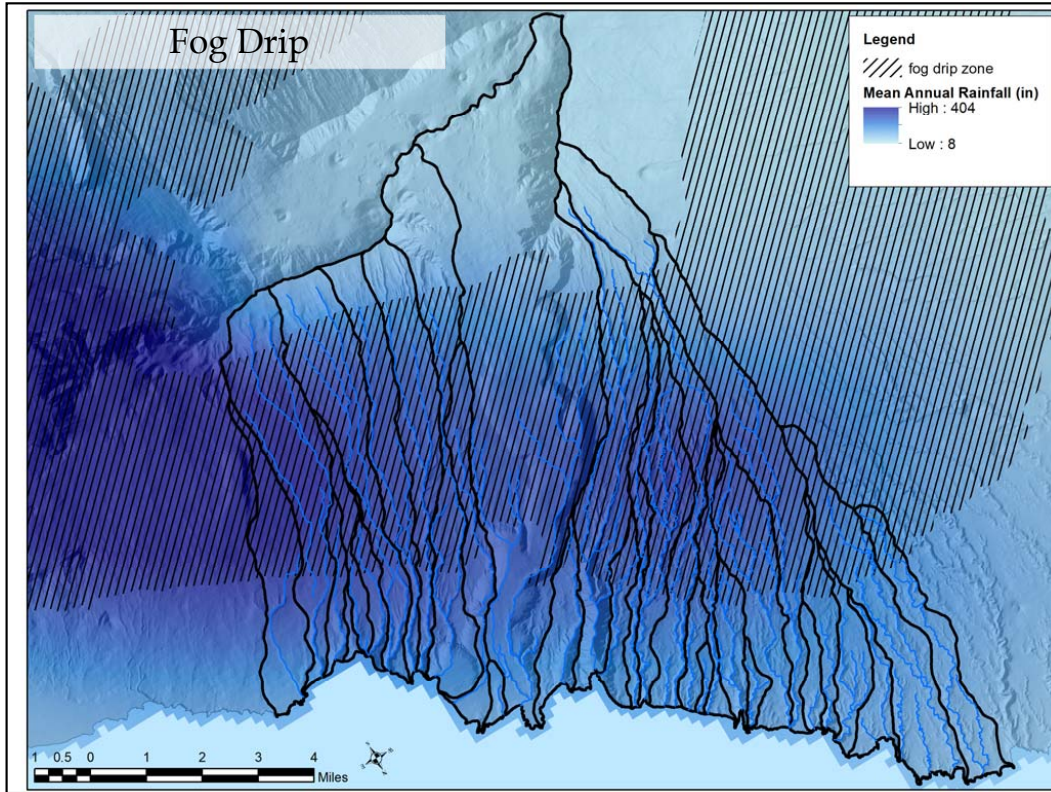
SLIDE 14 of 39



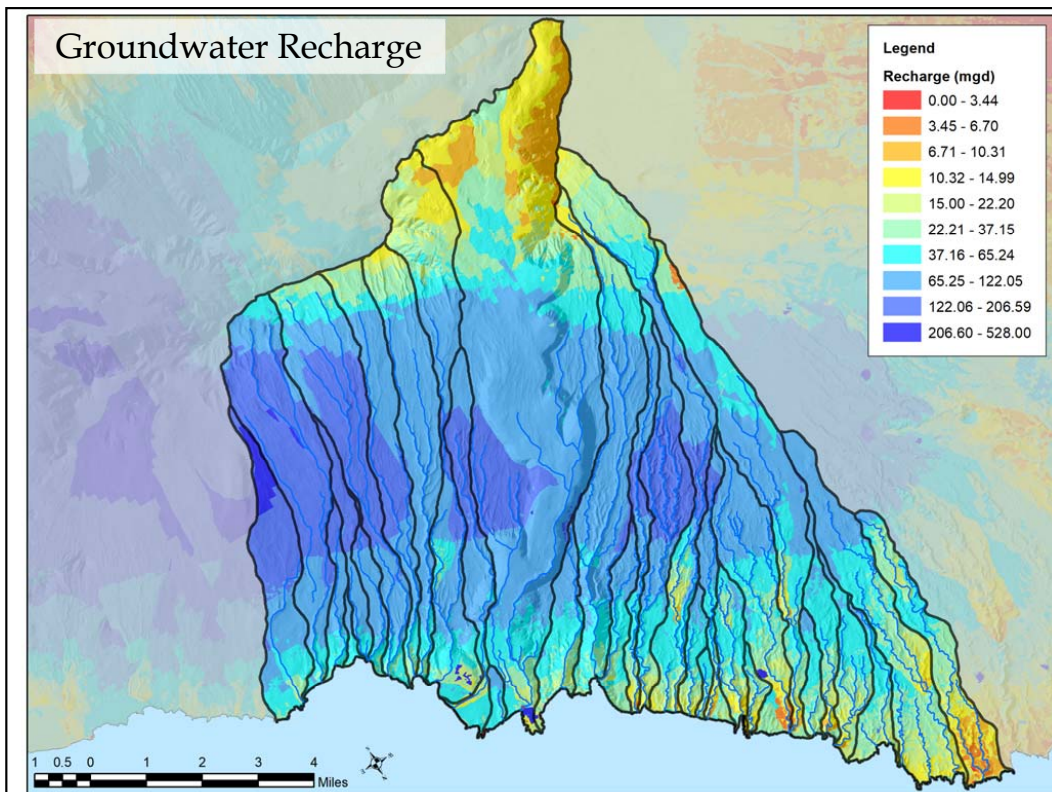
SLIDE 15 of 39



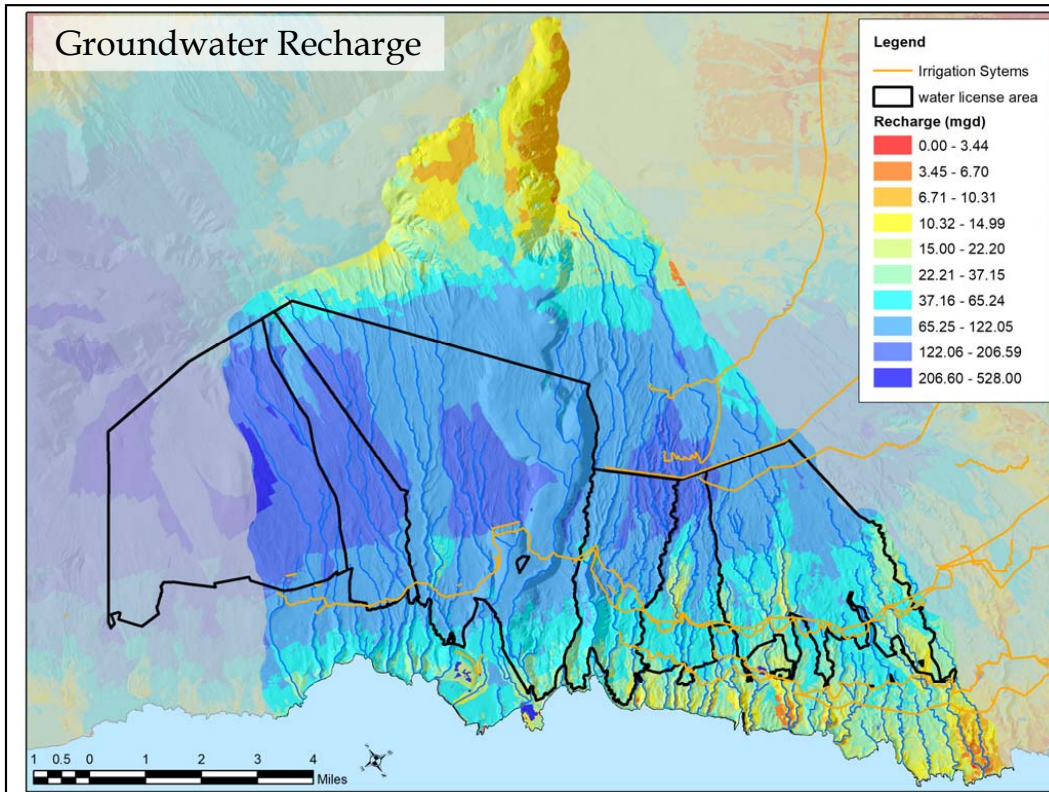
SLIDE 16 of 39



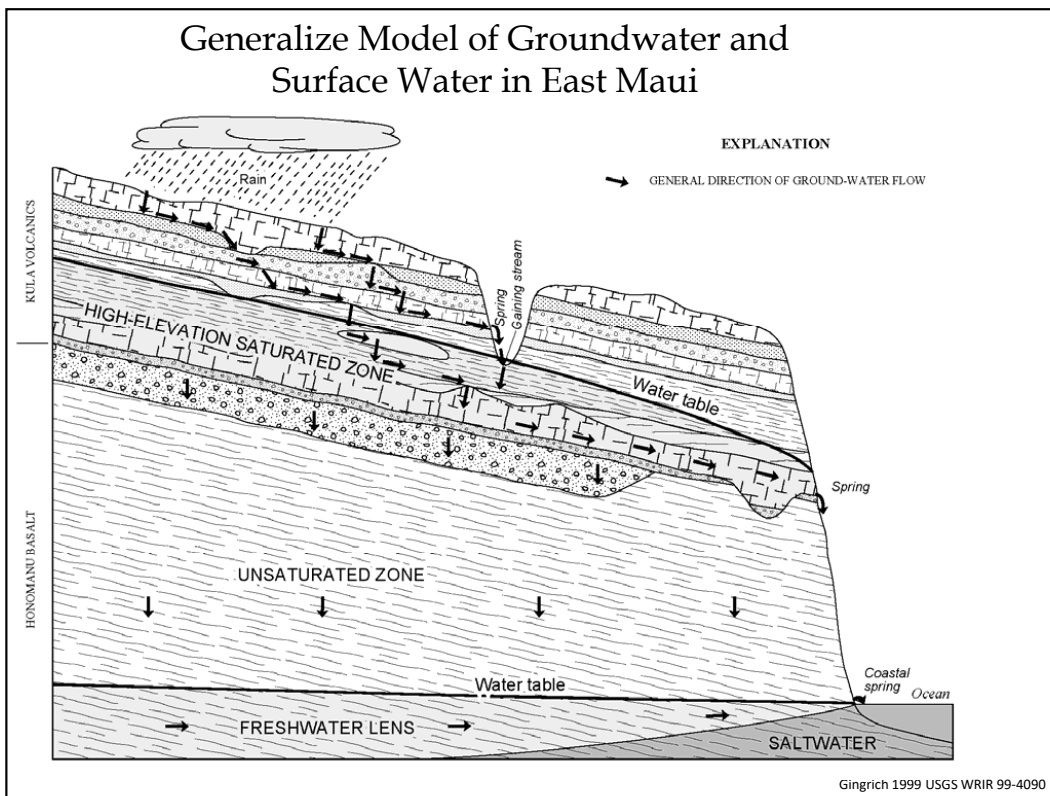
SLIDE 17 of 39



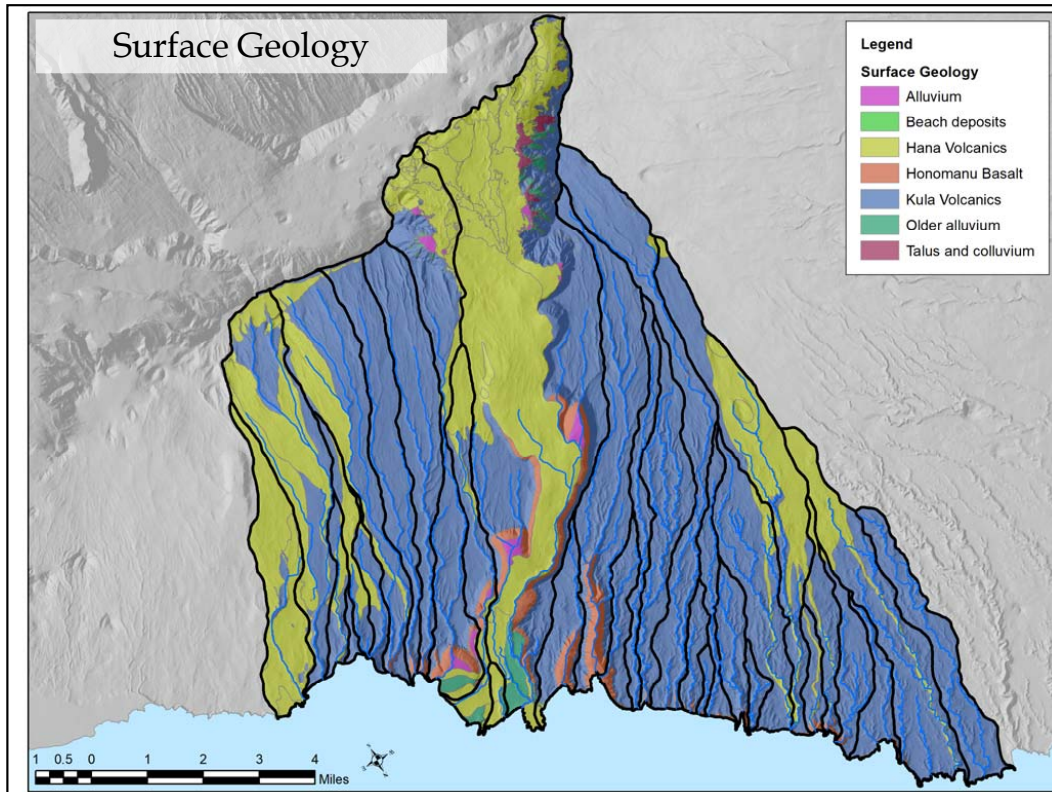
SLIDE 18 of 39



SLIDE 19 of 39



SLIDE 20 of 39



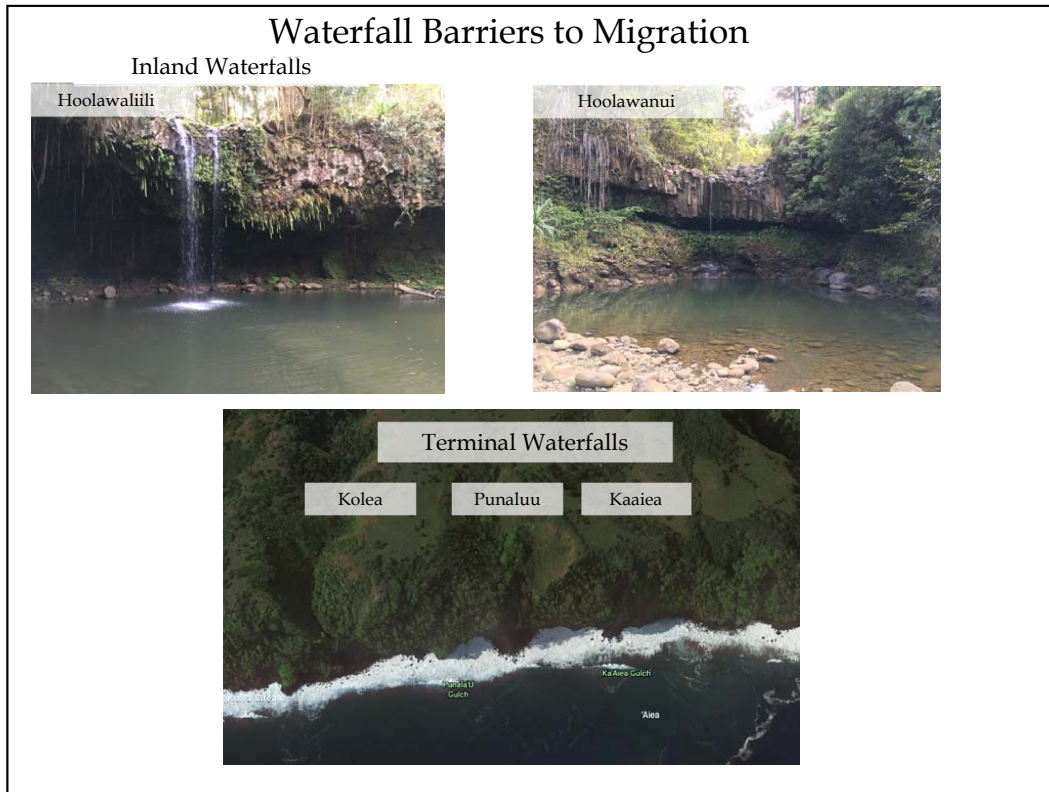
SLIDE 21 of 39

Determination of Naturally Available Habitat

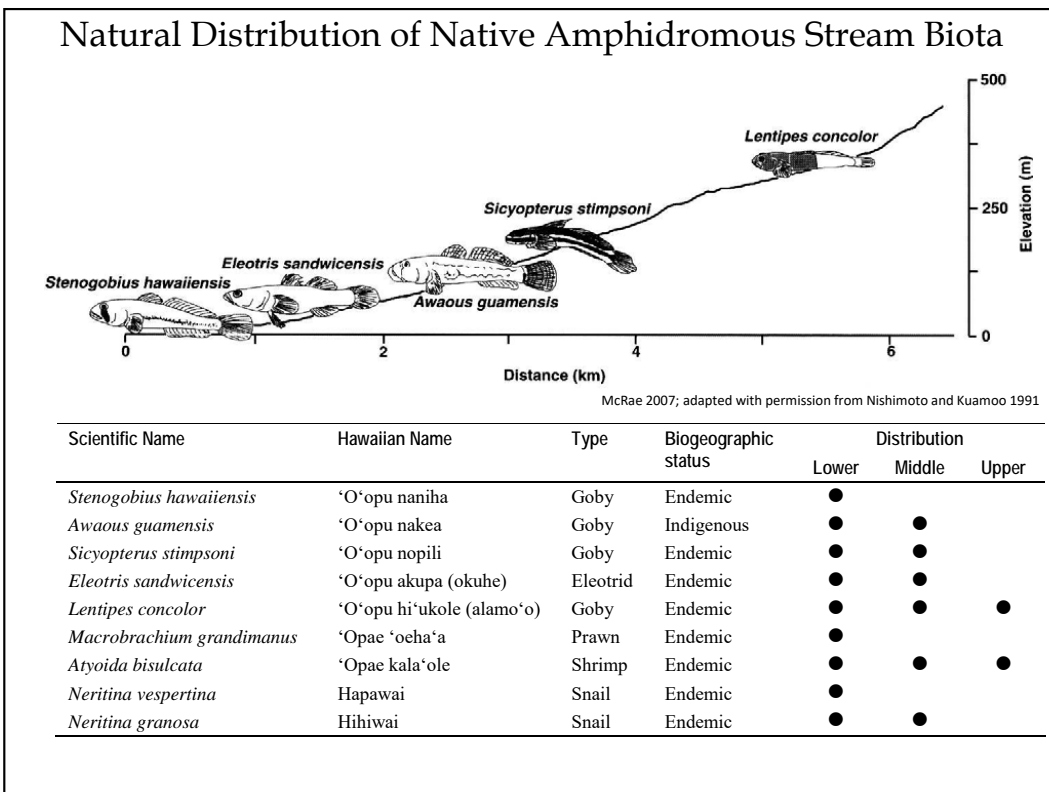
- 2. Elevation & distance inland
- 3. Streamflow/habitat type (pool, run, riffle, cascade)



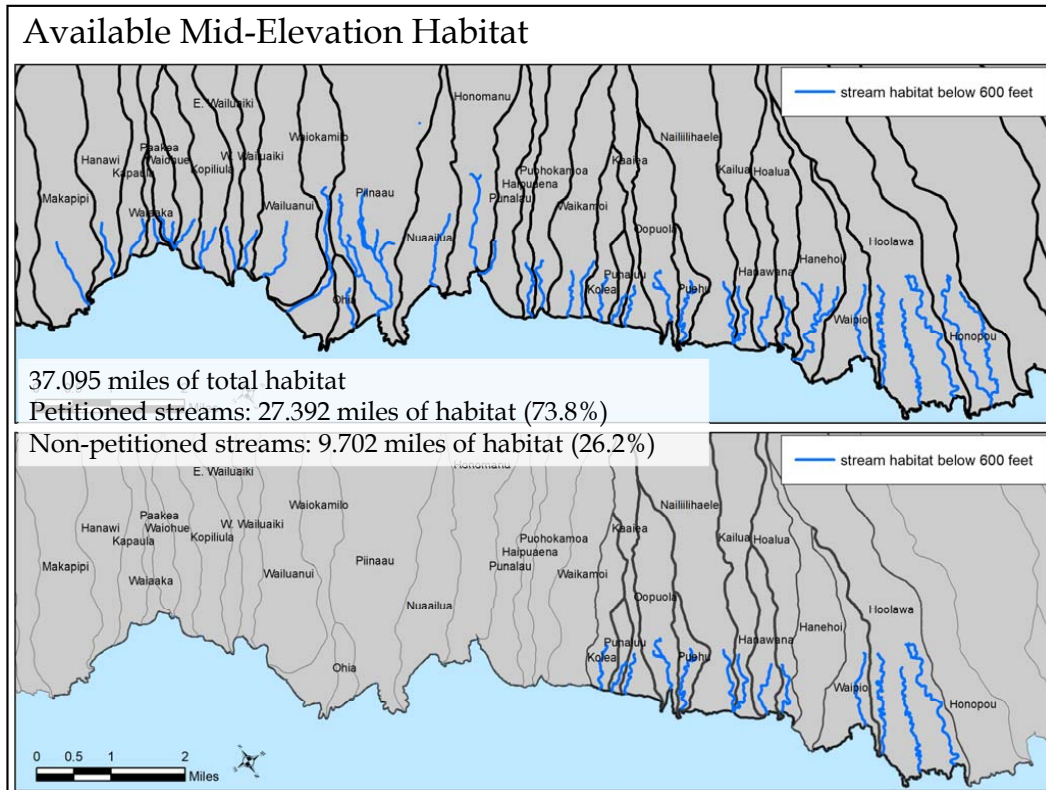
SLIDE 22 of 39



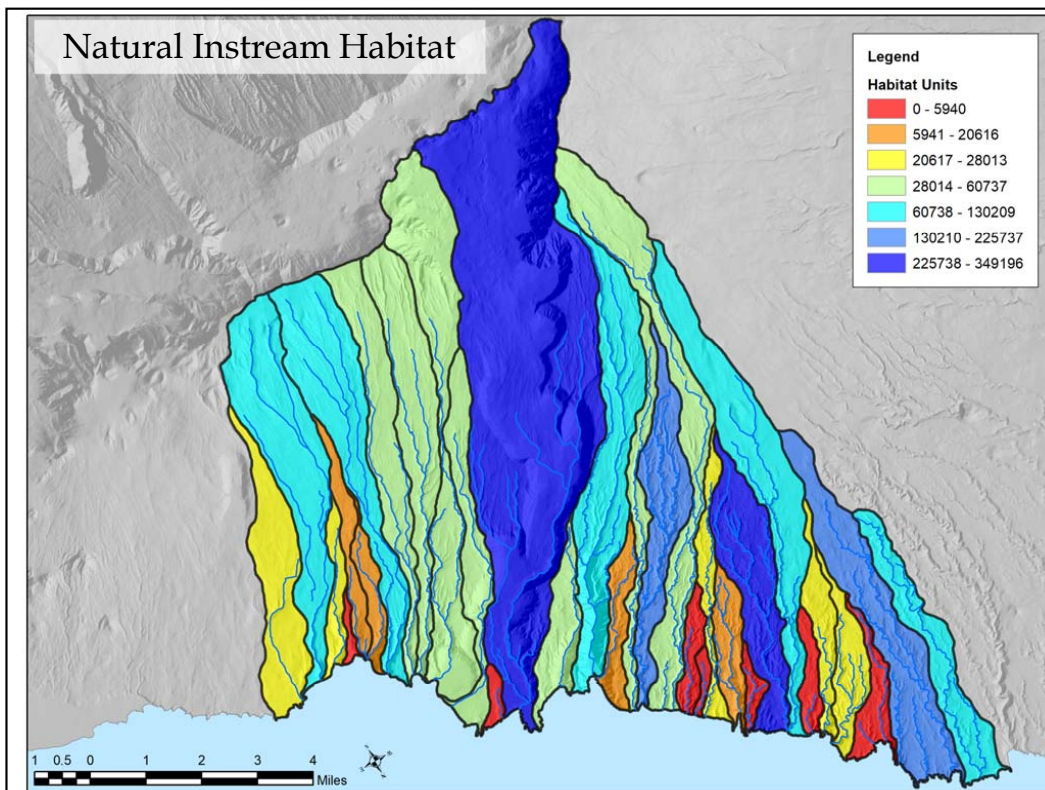
SLIDE 23 of 39



SLIDE 24 of 39



SLIDE 27 of 39



SLIDE 28 of 39

2018 CWRM D&O: Consequences for Stream Habitat

Region	Natural Habitat Units (m ²)	Percent of total	2018 CWRM D&O Habitat Units (m ²)	Percent of Available
2001 petitioned hydrologic units	1,392,812	66.0%	1,075,132	77.2%
Other 11 hydrologic units	717,242	34.0%	94,092	13.1%
total	2,110,054	100.0%	1,169,224	55.4%

Conservation Goals:

1. Protect a diversity of habitat types
2. Protect a diversity of habitat locations
3. Fully restore a few select streams instead of partially restoring many

Limitations to successful conservation:

1. Streamflow → some streams are naturally too small
2. Geology → waterfalls naturally restrict species distribution
3. Invasive riparian vegetation → limit usable habitat, movement of biota

Take home:
2018 CWRM D&O focused on the streams with the greatest potential to support aquatic biota

SLIDE 29 of 39

Hawaii Stream Assessment Rankings

Stream	Aquatics Resources	Riparian Resources	Cultural Resources	Recreational Resources	Diversity of Resources	Blue Ribbon Resources
Honopou	0	0	3	2		
Ho'olawa	1	0	3	3		
Waipi'o	0	0	0	0		
Hanehoi	0	0	0	0		
Hoalua	0	0	3	0		
Hānawana	0	0	3	2		
Kailua	2	0	3	3		
Nailiilihaele	1	0	0	2		
Puehu	0	0	0	0		
Oopuola	0	0	0	3		
Kaaiea	0	0	0	3		
Punalu'u	n/a	n/a	n/a	n/a		
Kōlea	0	0	0	0		
Waikamoi	1	3	0	3		
Waihinapee	n/a	n/a	n/a	n/a		
Puhokamoa	1	3	0	3		
Haipuaena	1	0	0	2		
Punalau	1	0	0	0		
Honomanū	1	4	0	4		
Nua'aīlua	1	0	0	3		
Pi'ina'au	4	4	0	4	AqRpRe	AqCu
Ōhi'a	0	0	3	3		
Waiokamilo	0	0	0	4		
Wailuanui	4	3	3	4		
W. Wailuaiki	2	3	0	4		
E. Wailuaiki	2	4	0	4		
Kopiilua	2	4	0	3		
Waiohue	4	0	0	4	ReAq	Aq
Pa'akea	2	0	0	3		
Waiaka	0	0	0	3		
Kapaula	1	0	0	3		
Hānawī	4	4	0	4	AqRpRe	AqRe
Makapipi	4	0	4	3		

non-petitioned streams

SLIDE 30 of 39

East Wailuaiki Stream below Koolau Ditch



SLIDE 31 of 39

Waipio Stream above New Hamakua Ditch



Waipio Stream below New Hamakua Ditch



SLIDE 32 of 39

Waipio Stream above
Lowrie Ditch



Waipio Stream below
Lowrie Ditch



SLIDE 33 of 39

Kolea Stream above
Wailoa Ditch

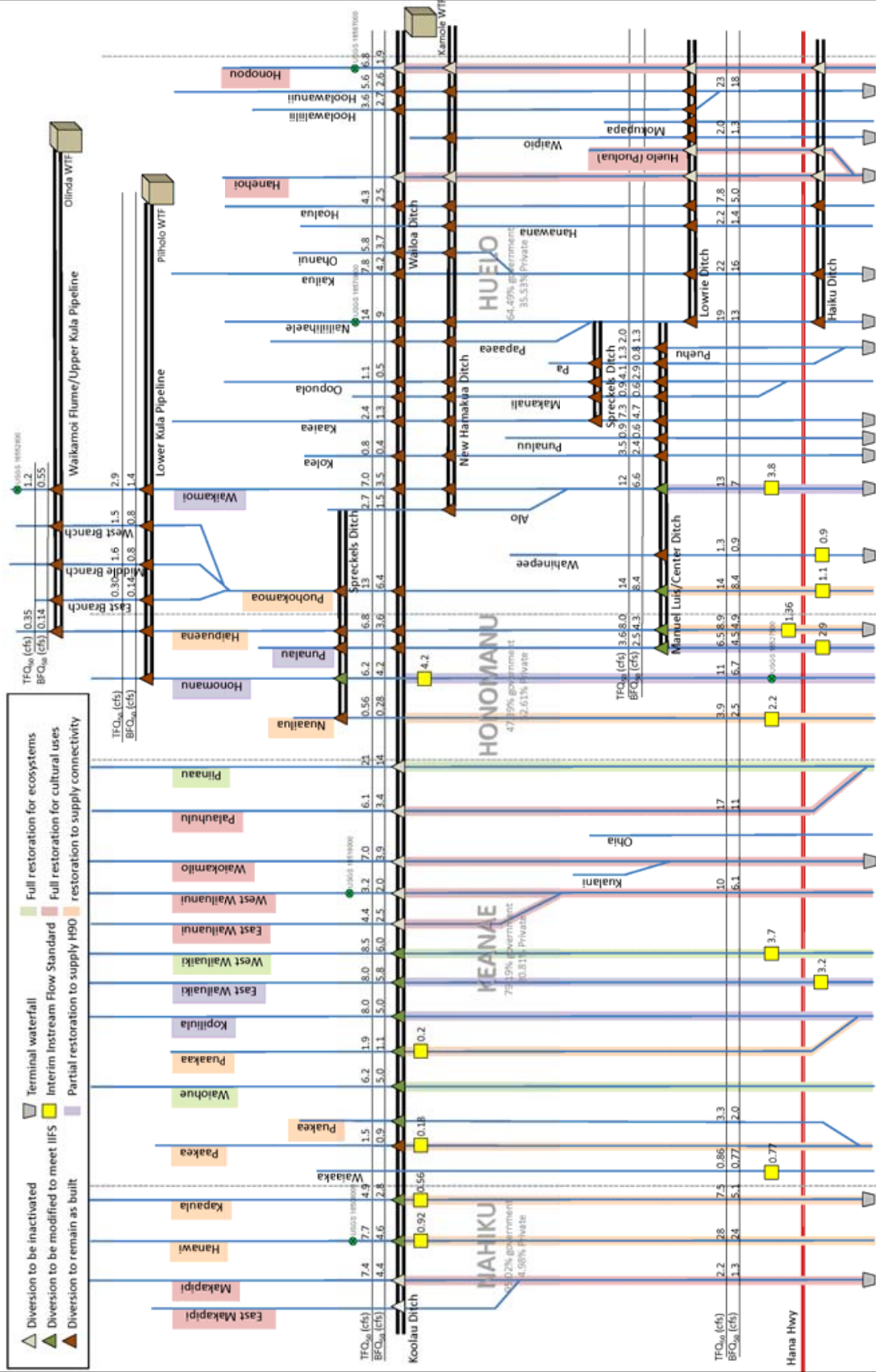


Kolea Stream Intake on
Wailoa Ditch

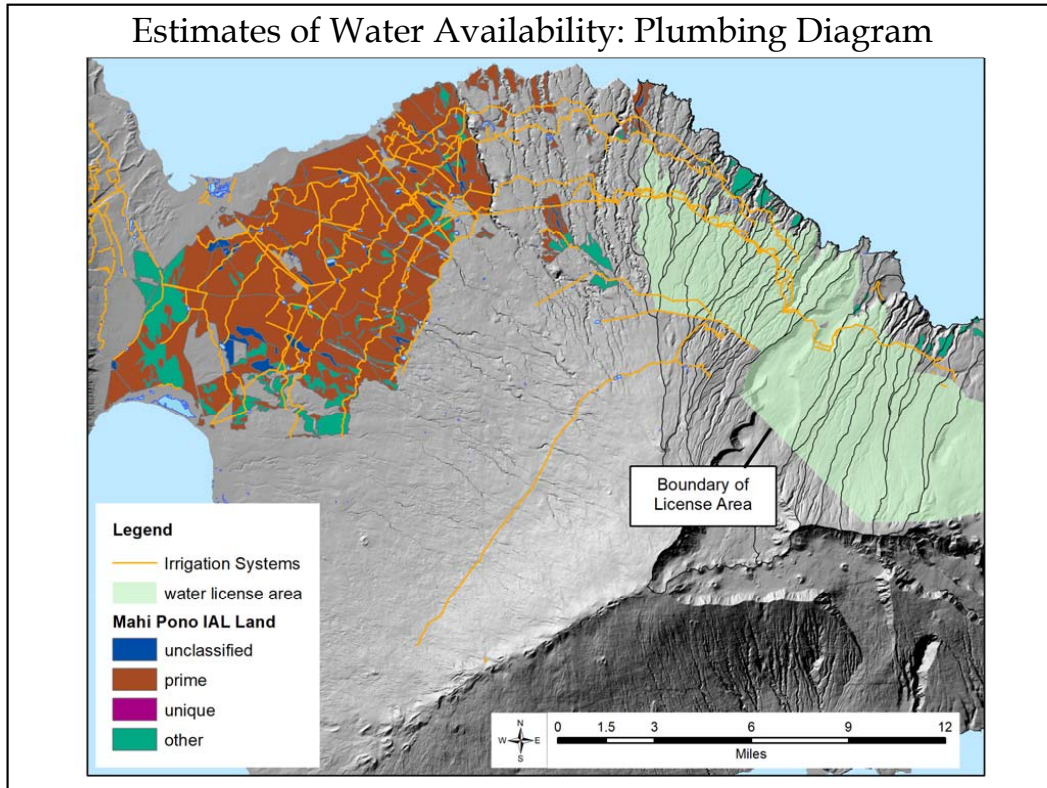


SLIDE 34 of 39

Estimates of Water Availability: Plumbing Diagram



Not to scale



SLIDE 36 of 39

Estimates of Water Availability

	Total Flow Q_{50}		Total Flow Q_{50}
License Area Irrigation System Flows	2011-2015	Implementation of 2018 CWRM D&O	2011-2015
Wailoa Ditch at Honopou	135.3 cfs	Total Flow Diverted	191.2 cfs
New Hamakua Ditch at Honopou	19.3 cfs	2018 D&O IIFS implementation	-70.2 cfs
Lowrie Ditch at Honopou	16.9 cfs	County DWS	-10.5 cfs
Haiku Ditch at Honopou	6.5 cfs	Remaining for diversified agriculture	110.6 cfs
Non-License Area Irrigation System Flows		Flow from License Area post 2018 CWRM D&O	97.3 cfs
All gains between Honopou and Maliko Gulch	13.3 cfs		
total	191.2 cfs		
Petitioned Streams	94.9 cfs		
Non-petitioned Streams	83 cfs		

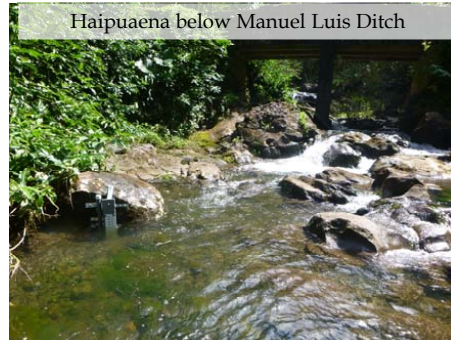
Balance:

1. To provide Maui DWS with sufficient water
2. To support 90% of the reasonable irrigation needs of the lands designated as Important Agricultural Lands

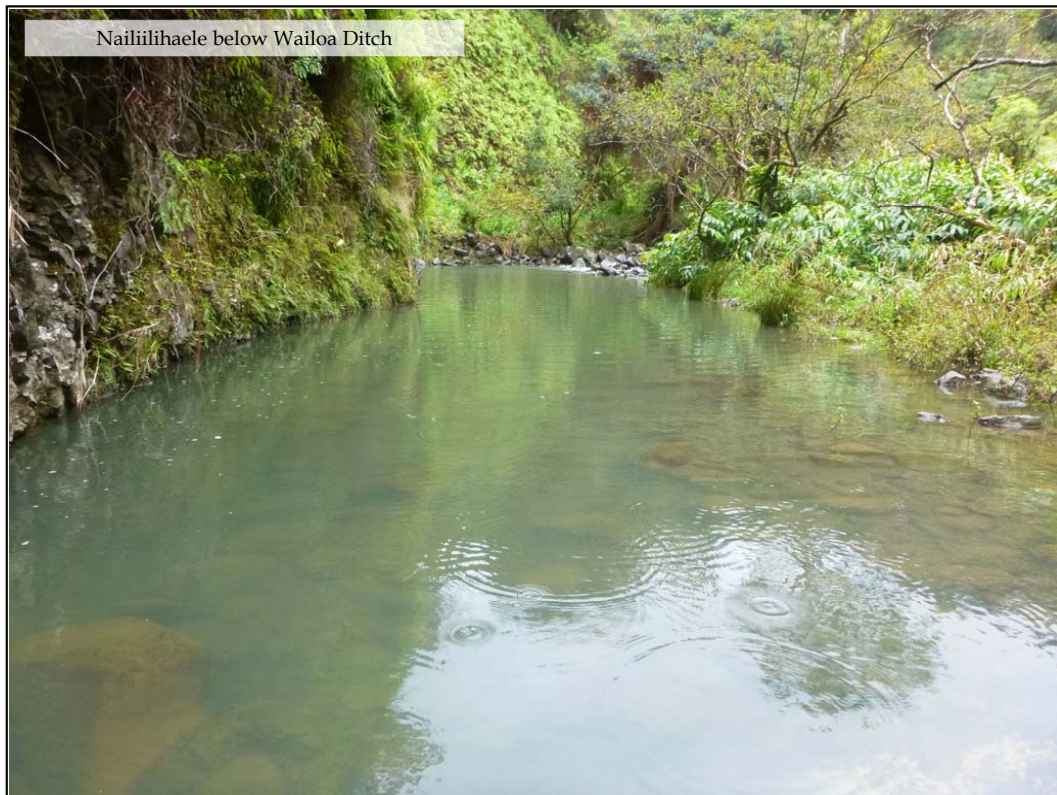
→ assumed water would be available from non-petitioned streams to meet non-instream uses

SLIDE 37 of 39

Monitoring amended IIFS in East Maui



SLIDE 38 of 39



SLIDE 39 of 39