

OBSERVATION INFO

Observer Name: _____
 Site ID: _____
 Observation Date: _____

BEAVER BUILT DAMS?

- Beaver-only Built Dams
- Beaver Dam Analogue (manmade)
- Mix of beaver-built and manmade

COMPLEX TYPE:

- Single Dam only
- Primary + One or More Secondary
- Multiple Possible Primaries + One or More Secondary

OBSERVATION CHRONOLOGY

- New Observation of New Complex
- First Observation of Existing Complex
- First Observation of Relic Complex
- Repeat Observation of Existing Complex

POSITIONAL ATTRIBUTES

LOCATION OF PRIMARY DAM

GPS UTM Easting: _____
 GPS UTM Northing: _____

COMPLEX LOCATION RELATIVE TO CHANNEL(S)

- On Main Channel
- On Right Side Channel(s)
- On Left Side Channel(s)
- On Left Floodplain
- On Right Floodplain

DAM COMPLEX ATTRIBUTES AT TIME OF SURVEY (IF APPLICABLE)

Primary dam max height (m) +/- 0.1 m _____
 Primary pond max depth (m) +/- 0.1 m _____
 Dam height range (m) +/- 0.1 m _____

SIDE CHANNELS

NOW:	@ HIGH(ER) TYPICAL FLOOD:
<input type="checkbox"/> None	<input type="checkbox"/> None
<input type="checkbox"/> Single Left	<input type="checkbox"/> Single Left
<input type="checkbox"/> Multiple Left	<input type="checkbox"/> Multiple Left
<input type="checkbox"/> Single Right	<input type="checkbox"/> Single Right
<input type="checkbox"/> Multiple Right	<input type="checkbox"/> Multiple Right
<input type="checkbox"/> None	<input type="checkbox"/> None

LATERAL VALLEY BOTTOM EXTENT OF COMPLEX

- Limited to within one bankfull channel
- Occupying multiple bankfull channel
- Occupying single channel & partial valley bottom w. % _____
- Occupying multiple channels & partial valley bottom % _____
- Impacting entire valley bottom width

STATUS

- Active
- Abandon
- Historic/Relic

CONFIDENCE IN STATUS

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess

FLOW CONDITION

- Baseflow
- Spring runoff
- Flood
- Post Flood

COMPLEX SIZE

Number of Primary Dams: _____
 Number of Secondary Dams: _____

POSITION OF DAMS

Primary Dam Location: Top Bottom In-between
 Number of Secondary Dams Upstream of Primary: _____
 Number of Secondary Dams Downstream of Primary: _____

Pond depth range (m) +/- 0.1 m _____
 Primary water surface drop (m) +/- 0.1 m _____
 Primary dam crest length (m) +/- 1 m _____

- < 25 m
- 50 - 100 m
- 25 - 50 m
- 100 - 250 m
- 250 - 500 m
- > 500 m

FLOODPLAIN INUNDATION

- During Extreme Floods - River Right
- During Extreme Floods - River Left
- During Seasonal Floods - River Right
- During Seasonal Floods - River Left
- Year Round Inundation - River Right
- Year Round Inundation - River Left

ESTIMATED COMPLEX AGE

- < 1 year
- 1-3 years
- 3-5 years
- 5 - 10 years
- > 10 years

Evidence (optional): _____

DAM CONDITIONS (IF APPLICABLE)

FLOW TYPES PRESENT (OF WHAT DAMS)

Flow Over Top	<input type="checkbox"/> Primary	<input type="checkbox"/> Secondary
Basal Flow	<input type="checkbox"/> Primary	<input type="checkbox"/> Secondary
Throughflow	<input type="checkbox"/> Primary	<input type="checkbox"/> Secondary
Flow Around Left	<input type="checkbox"/> Primary	<input type="checkbox"/> Secondary
Flow Around Right	<input type="checkbox"/> Primary	<input type="checkbox"/> Secondary

PRIMARY DAM BREACH OR BLOWOUT

- Intact
- Minor breach (< 25 cm height) on left
- Minor breach (< 25 cm height) on right
- Minor breach (< 25 cm height) on center
- Minor basal breach

RECENT BEAVER MAINTENANCE OF COMPLEX:

DAM EXPANSION

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

DAM CONSTRUCTION

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

DAM MAINTENANCE

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

SCENT MOUND

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

CANAL DIGGING

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

POND EXCAVATION

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

DAM NOTCHING

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

DRAINING/FLUSHING

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

- Major breach (> 25 cm height) on left
- Major breach (> 25 cm height) on right
- Major breach (> 25 cm height) on center
- Major basal breach
- Blowout (whole height of dam breached)

PRIMARY POND CAPACITY

- Clean
- Minor Sedimentation
- Partial Filling (upto 50% of original pond capacity)
- Major Filling (50% to 95% of original pond capacity)
- Full of sediment (no longer a pond)

CORN ON THE COB (FORAGING)

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

FELLING OF TREES

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

HARVESTING OF BRANCHES

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

SKID TRAIL USAGE

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity
- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

PRIMARY WOOD HARVESTED

- Aspen
- Cottonwood
- Willow
- Other Hardwoods
- Conifers
- No active harvesting

ABOVE GROUND LODGE MAINTENANCE OR CONSTRUCTION

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

BANK LODGE MAINTENANCE OR CONSTRUCTION

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

BEAVER DAM & ACTIVITY MONITORING FORM

OBSERVATION INFO

Observer Name: _____

Site ID: _____

Observation Date: _____

OBSERVATION TYPE:

- Beaver Dam
- BDSS
- Beaver Activity (no dam)

OBSERVATION CHRONOLOGY

- New Observation of New Feature
- First Observation of Existing Feature
- First Observation of Relic Feature
- Repeat Observation of Existing Feature

STATUS

- Active
- Abandon
- Historic/Relic

CONFIDENCE IN STATUS

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess

FLOW CONDITION

- Baseflow
- Spring runoff
- Flood
- Post Flood

POSITIONAL ATTRIBUTES

GPS UTM Easting: _____

GPS UTM Northing: _____

DAM LOCATION RELATIVE TO CHANNEL(S)

- On Main Channel
- On Right Side Channel(s)
- On Left Side Channel(s)
- On Left Floodplain
- On Right Floodplain

PART OF DAM COMPLEX?

Dam Complex ID _____

- Start of new dam complex
- Existing dam complex
- NA - Isolated Dam
- NA - Non-Dam

DAM ATTRIBUTES AT TIME OF SURVEY (IF APPLICABLE)

Max dam height (m) +/- 0.1 m _____

Max pond depth (m) +/- 0.1 m _____

Water Surface Difference (m) (m) +/- 0.1 m _____

Dam Length (m) (m) +/- 1 m _____

DISTANCE UPSTREAM OF POND BACKWATER

- < 5 m
- 5 - 10 m
- 10 - 25 m
- 25 - 50 m
- 50 - 100 m
- > 100 m

FLOODPLAIN INUNDATION

- During Extreme Floods - River Right
- During Extreme Floods - River Left
- During Seasonal Floods - River Right
- During Seasonal Floods - River Left
- Year Round Inundation - River Right
- Year Round Inundation - River Left

SIDE CHANNELS

- None
- Single Left
- Multiple Left
- Single Right
- Multiple Right

DAM MATERIALS USED (CIRCLE DOMINANT)

- Woody branches > 15 cm diameter
- Woody branches < 15 cm diameter
- Mud
- Grass / Reeds
- Other organic
- Cobble or Boulders

POND EXTENT

- Contained within bankfull channel
- Expanding out onto floodplain
- Drained

ESTIMATED DAM AGE

- < 1 year
- 1-3 years
- 3-5 years
- 5 -10 years
- > 10 years

DAM CONDITION (IF APPLICABLE)

FLOW TYPES

(Specify Value 0-100%; Sum should be 100%)

Flow Over Top _____
Basal Flow _____
Throughflow _____
Flow Around Left _____
Flow Around Right _____
Total Check = 100%?

DAM BREACH OR BLOWOUT

- In-tact
- Minor breach (< 25 cm height) on left
- Minor breach (< 25 cm height) on right
- Minor breach (< 25 cm height) on center
- Minor basal breach
- Major breach (> 25 cm height) on left
- Major breach (> 25 cm height) on right
- Major breach (> 25 cm height) on center
- Major basal breach
- Blowout (whole height of dam breached)

RECENT BEAVER ACTIVITY:

Only answer all questions with respect to recent (past 6 months)

DAM EXPANSION

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

DAM CONSTRUCTION

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

DAM MAINTENANCE

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

SCENT MOUND

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

CANAL DIGGING

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

POND EXCAVATION

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

DAM NOTCHING

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

DRAINING/FLUSHING

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

POND CAPACITY

- Clean
- Minor Sedimentation
- Partial Filling (upto 50% of original pond capacity)
- Major Filling (50% to 95% of original pond capacity)
- Full of sediment (no longer a pond)

DOMINANT SUBSTRATE IN DEEPEST PART OF POND

- Fines (clays and silts)
- Sands
- Gravels
- Cobble
- Food Cache & Fines

DOMINANT SUBSTRATE AT POND ENTRANCE

- Fines (clays and silts)
- Sands
- Gravels
- Cobble
- Food Cache & Fines

NOTES:

CORN ON THE COB (FORAGING)

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

FELLING OF TREES

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
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HARVESTING OF BRANCHES

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

SKID TRAIL USAGE

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity
- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

PRIMARY WOOD HARVESTED

- Aspen
- Cottonwood
- Willow
- Other Hardwoods
- Conifers
- No active harvesting

ABOVE GROUND LODGE MAINTENANCE OR CONSTRUCTION

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity

BANK LODGE MAINTENANCE OR CONSTRUCTION

- Certain - Documented Evidence
- Probable - Strong Evidence
- Possible - Anecdotal or Inconclusive Evidence
- Unsure - Just a guess
- No Evidence of Activity



OBSERVATION INFO

Observer Name: _____
 Reach ID: _____

Observation Date: _____

ASSESSMENT PURPOSE

- Comparison with BRAT-FIS
- Assess risk of nuisance beaver dam building
- Support Beaver Restoration Planning or Design

ASSESSMENT TYPE

- Site Visit – Contemporary Conditions
- Site Visit – Potential Future Conditions (following restoration)

LOCATION OF ASSESSMENT REACH

GPS UTM Easting: _____

GPS UTM Northing: _____

Stream Name: _____

LENGTH OF REACH

Length _____ meters OR _____ x bankfull widths

VEGETATION CAPACITY TO SUPPORT DAM BUILDING ACTIVITY

SUITABILITY OF STREAMSIDE VEGETATION

- Unsuitable
 - Barely Suitable
 - Moderately Suitable
 - Suitable
 - Preferred
- Vegetation within 30 m of water's edge*

What vegetation types are abundant?

- Desirable woody (e.g. Aspen, Willow, Cottonwood)
- Other woody (e.g. conifers, sagebrush)
- Grasses Crops Ornamentals Developed

SUITABILITY OF RIPARIAN/UPLAND VEGETATION

- Unsuitable
 - Barely Suitable
 - Moderately Suitable
 - Suitable
 - Preferred
- Vegetation within 100 m of water's edge*

What vegetation types are abundant?

- Desirable woody (e.g. Aspen, Willow, Cottonwood)
- Other woody (e.g. conifers, sagebrush)
- Grasses Crops Ornamentals Developed

DAM DENSITY CAPACITY ASSESSMENT BASED ON SUITABILITY OF VEGETATION ONLY (USE TABLE)

- None (no dams)
- Rare (0-1 dams/km)
- Occasional (1-4 dams/km)
- Frequent (5-15 dams/km)
- Pervasive (15-40 dams/km)

COMBINED CAPACITY TO SUPPORT DAM BUILDING ACTIVITY

CAN BEAVER BUILD A DAM AT BASEFLOWS?

- Probably can build dam
- Can build dam
- Can build dam (saw evidence of recent dams)
- Could build dam at one time (saw evidence of relic dams)
- Cannot build dam (streampower really high)

IF BEAVERS BUILD A DAM, CONSIDER WHAT HAPPENS TO THE DAM(S) IN A TYPICAL FLOOD (E.G. MEAN ANNUAL FLOOD)?

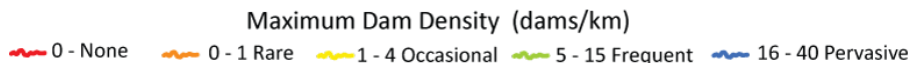
- Blowout Occasional Blowout
- Occasional Breach Dam Persists

HOW DOES THE REACH SLOPE IMPACT THEIR ABILITY OR NEED TO BUILD DAMS?

- So steep they cannot build a dam (e.g. > 20% slope)
- Probably can build dam
- Can build dam (inferred)
- Can build dam (evidence or current or past dams)
- Really flat (can build dam, but might not need as many as one dam might back up water > 0.5 km)

COMBINED DAM DENSITY CAPACITY ASSESSMENT BASED ON ALL (USE TABLE)

- None (no dams)
- Rare (0-1 dams/km)
- Occasional (1-4 dams/km)
- Frequent (5-15 dams/km)
- Pervasive (15-40 dams/km)



ADDITIONAL ATTRIBUTES

STREAMFLOW

- Perennial
- Potentially Intermittent
- Intermittent
- Potentially Ephemeral
- Ephemeral

IF INTERMITTENT, HOW FAR TO WATER SOURCE?

- < 1 km
- 1 – 5 km
- > 5 km

CHANNEL SETTING

- Only Channel
- Primary Anabranch
- Secondary Anabranch or Side Channel
- Backwater

EVIDENCE OF CURRENT OR PAST BEAVER DAM ACTIVITY?

AGE OF ACTIVITY

- Current
- Recent (Past 3 months)
- Past Year (3 – 12 months)
- Relic (Former > 1 year ago)

TYPES OF ACTIVITY

- Dam Building
- Dam Maintenance
- Food Caching
- Woody Material Harvest

HOW MANY DAMS?

- How many primary dams? _____
- How many secondary dams? _____
- TOTAL DAMS: _____
- How many dam complexes? _____

HOW ACTIVE?

- All maintained
- Some maintained
- Some maintenance but all intact
- Some maintenance - mixed intact, breached, blown out
- No maintenance - but all intact
- No maintenance - mixed intact, breached, blown out
- No maintenance - all breached or blown out

POTENTIAL FOR BEAVER TO POSE A NUISANCE THREAT

PROXIMITY OF REACH TO HUMAN ACTIVITY

- Immediately adjacent to channel & in valley bottom (could be flooded)
- Adjacent to channel & outside valley bottom (minimal or no flooding threat)
- Adjacent but outside valley bottom of reach
- In upstream reach's valley bottom
- In downstream reach's valley bottom

TYPES OF HUMAN ACTIVITY

- Road
- Bridge
- Culvert
- Weir
- Point of Diversion
- Residential
- Commercial / Industrial
- Agriculture (arable or irrigated)
- Ag. (orchard/vineyard)
- Ag (pasture / ranching)

Notes:

POTENTIAL THREATS OF BEAVER DAMS IN REACH

- Backwater flooding (from crest elevation of dam)
- Elevated water tables threatening infrastructure
- Damage to infrastructure from blowout
- Clogging (of culverts, stormdrains, etc.)

- Undesirable harvest of trees

IF THREATS, ARE THEY EASILY MITIGATABLE?

- No
- Yes, easy with living with beaver mitigation (e.g. pond-levelers, caging, deterrents, etc.)
- Could be mitigated (but difficult)
- Live-Trapping an option

AVAILABILITY OF GOOD HABITAT NEARBY

- Reaches within 5 km upstream with good habitat and minimal conflict (i.e. expansion zone)
- Reaches within 5 km downstream with good habitat and minimal conflict (i.e. expansion zone)
- Reaches within 5 km upstream with good habitat and considerable conflict (i.e. expansion zone)
- Reaches within 5 km downstream with good habitat and considerable conflict (i.e. expansion zone)
- Expansion zones > 5 km away but < 20 km away
- Likely human-beaver conflict zones > 5 km, but < 20 km away

INFERENCE SYSTEM OF CAPACITY BASED ON VEGETATION ONLY

Table 2

Rule table for two input fuzzy inference system that models the capacity of the riverscape to support dam building activity (in dam density) using the suitability of streamside vegetation and suitability of riparian/upland vegetation as inputs.

Rules	If	Inputs		Output
		Suitability of streamside vegetation	Suitability of riparian/upland vegetation	
	1	Unsuitable	& Unsuitable	, then None
	2	Barely suitable	& Unsuitable	, then Rare
	3	Moderately suitable	& Unsuitable	, then Occasional
	4	Suitable	& Unsuitable	, then Occasional
	5	Preferred	& Unsuitable	, then Occasional
	6	Unsuitable	& Barely suitable	, then Rare
	7	Barely suitable	& Barely suitable	, then Occasional
	8	Moderately suitable	& Barely suitable	, then Occasional
	9	Suitable	& Barely suitable	, then Frequent
	10	Preferred	& Barely suitable	, then Frequent
	11	Unsuitable	& Moderately suitable	, then Occasional
	12	Barely suitable	& Moderately suitable	, then Rare
	13	Moderately suitable	& Moderately suitable	, then Frequent
	14	Suitable	& Moderately suitable	, then Frequent
	15	Preferred	& Moderately suitable	, then Pervasive
	16	Unsuitable	& Suitable	, then Rare
	17	Barely suitable	& Suitable	, then Frequent
	18	Moderately suitable	& Suitable	, then Frequent
	19	Suitable	& Suitable	, then Frequent
	20	Preferred	& Suitable	, then Pervasive
	21	Unsuitable	& Preferred	, then Occasional
	22	Barely suitable	& Preferred	, then Frequent
	23	Moderately suitable	& Preferred	, then Frequent
	24	Suitable	& Preferred	, then Pervasive
	25	Preferred	& Preferred	, then Pervasive

COMBINED INFERENCE SYSTEM:

Table 3

Rule table for three input fuzzy inference system that model the capacity of the riverscape to support dam building activity (in dam density) using the vegetative dam density capacity (output of Table 2 model), baseflow stream power, and the two-year flood stream power.

Rules	If	Inputs				Output
		Vegetative dam density capacity (FS)	Baseflow stream power	2-year flood stream power	Reach slope (%)	
	1	Unsuitable	& -	& -	& -	, then None
	2	-	& Cannot build dam	& -	& -	, then None
	3	-	& -	& -	& Cannot build dam	, then None
	4	Rare	& Can build dam	& Dam persists	& -	, then Rare
	5	Occasional	& Can build dam	& Dam persists	& -	, then Occasional
	6	Frequent	& Can build dam	& Dam persists	& Can build dam	, then Frequent
	7	Frequent	& Can build dam	& Dam persists	& Probably can build dam	, then Occasional
	8	Pervasive	& Can build dam	& Dam persists	& Really flat	, then Pervasive
	9	Pervasive	& Can build dam	& Dam persists	& Can build dam	, then Pervasive
	10	Pervasive	& Can build dam	& Dam persists	& Probably can build dam	, then Occasional
	11	Rare	& Can build dam	& Occasional breach	& -	, then Rare
	12	Occasional	& Can build dam	& Occasional breach	& -	, then Occasional
	13	Frequent	& Can build dam	& Occasional breach	& Can build dam	, then Frequent
	14	Frequent	& Can build dam	& Occasional breach	& Probably can build dam	, then Occasional
	15	Pervasive	& Can build dam	& Occasional breach	& Really flat	, then Occasional
	16	Pervasive	& Can build dam	& Occasional breach	& Can build dam	, then Frequent
	17	Pervasive	& Can build dam	& Occasional breach	& Probably can build dam	, then Occasional
	18	Rare	& Can build dam	& Occasional blowout	& -	, then Rare
	19	Occasional	& Can build dam	& Occasional blowout	& -	, then Occasional
	20	Frequent	& Can build dam	& Occasional blowout	& Can build dam	, then Frequent
	21	Frequent	& Can build dam	& Occasional blowout	& Probably can build dam	, then Occasional
	22	Pervasive	& Can build dam	& Occasional blowout	& Really flat	, then Occasional
	23	Pervasive	& Can build dam	& Occasional blowout	& Can build dam	, then Frequent
	24	Pervasive	& Can build dam	& Occasional blowout	& Probably can build dam	, then Occasional
	25	Rare	& Can build dam	& Blowout	& -	, then None
	26	Occasional	& Can build dam	& Blowout	& -	, then Rare
	27	Frequent	& Can build dam	& Blowout	& Can build dam	, then Rare
	28	Frequent	& Can build dam	& Blowout	& Probably can build dam	, then None
	29	Pervasive	& Can build dam	& Blowout	& Really flat	, then Rare
	30	Pervasive	& Can build dam	& Blowout	& Can build dam	, then Occasional
	31	Pervasive	& Can build dam	& Blowout	& Probably can build dam	, then Rare
	32	Rare	& Probably can build dam	& Occasional breach	& -	, then Rare
	33	Occasional	& Probably can build dam	& Occasional breach	& -	, then Occasional
	34	Frequent	& Probably can build dam	& Occasional breach	& Can build dam	, then Frequent
	35	Frequent	& Probably can build dam	& Occasional breach	& Probably can build dam	, then Occasional
	36	Pervasive	& Probably can build dam	& Occasional breach	& Really flat	, then Occasional
	37	Pervasive	& Probably can build dam	& Occasional breach	& Can build dam	, then Frequent
	38	Pervasive	& Probably can build dam	& Occasional breach	& Probably can build dam	, then Occasional
	39	Rare	& Probably can build dam	& Occasional blowout	& -	, then Rare
	40	Occasional	& Probably can build dam	& Occasional blowout	& -	, then Occasional
	41	Frequent	& Probably can build dam	& Occasional blowout	& Can build dam	, then Occasional
	42	Frequent	& Probably can build dam	& Occasional blowout	& Probably can build dam	, then Rare
	43	Pervasive	& Probably can build dam	& Occasional blowout	& Really flat	, then Occasional
	44	Pervasive	& Probably can build dam	& Occasional blowout	& Can build dam	, then Frequent
	45	Pervasive	& Probably can build dam	& Occasional blowout	& Probably can build dam	, then Occasional
	46	Rare	& Probably can build dam	& Blowout	& -	, then None
	47	Occasional	& Probably can build dam	& Blowout	& -	, then Rare
	48	Frequent	& Probably can build dam	& Blowout	& Can build dam	, then Rare
	49	Frequent	& Probably can build dam	& Blowout	& Probably can build dam	, then None
	50	Pervasive	& Probably can build dam	& Blowout	& Really flat	, then Rare
	51	Pervasive	& Probably can build dam	& Blowout	& Can build dam	, then Occasional
	52	Pervasive	& Probably can build dam	& Blowout	& Probably can build dam	, then Rare

