

IS IT A 'WETLAND'?
IS IT A 'RIVER'?
NO... IT'S A GREY
AREA

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Conn



The knee jerk reaction

National Policy Statement for Freshwater Management 2020 (NPS FM)

- New type of wetland = 'natural inland wetland'
- Excluded some types of 'wetland'

National Environmental Standards Freshwater (NES F)

- Prohibition of many activities in wetlands
- More lenient rules for activities in rivers

River....or wetland....?



Arbitrary impositions

river means a continually or intermittently flowing watercourse; but does not include any artificial watercourse the supply of water for electricity power generation.

wetland includes permanently or intermittently flooded ecosystem of plants and animals that are adapted to such conditions.

Modified watercourse: An artificial or modified channel that may or may not be a watercourse.

Perennial stream: A stream that flows all year round.

Permanent river or stream: A river or stream that flows continuously.

The continually flowing: A river or stream that flows continuously.

Intermittently flowing river or stream: A river that is naturally dry at certain intervals but has the following characteristics:

- Naturally occurring wetland:** A naturally occurring wetland includes:
- (a) wetlands which are part of river, stream and lake beds;
 - (b) natural ponds, swamps, marshes, fens, bogs, seeps, brackish areas, mountain wetlands, and other naturally wet areas that support an indigenous ecosystem of plants and animals specifically adapted to living in wet conditions, and provide a habitat for wildlife;
 - (c) coastal wetlands above mean high water springs;
 - (d) wet pasture or where water temporarily ponds after rain or pasture containing patches of rushes (juncus species);
 - (e) oxidation ponds;
 - (f) artificial wetlands used for wastewater or stormwater treatment;
 - (g) artificial farm dams and detention dams;
 - (h) artificial watercourses such as farm drainage canals;
 - (i) reservoirs for firefighting, domestic or community water supply;
 - (j) temporarily ponded rainfall.

A watercourse that is naturally dry at certain intervals but has the following characteristics:	
(a)	it has natural pools, and
(b)	it has a well-defined channel, such that the bed and banks can be distinguished;
(c)	it contains surface water more than 48 hours after a rain event which results in stream flow;
(d)	rooted terrestrial vegetation is not established across the entire cross-sectional width of the channel;
(e)	organic debris resulting from flood can be seen on the floodplain; or
(f)	there is evidence of substrate sorting process, including scour and deposition.
Note: An ephemeral watercourse is a watercourse that is naturally dry at certain intervals but does not have any of the characteristics listed in (a) to (f).	



Intermittent stream: Stream reaches that cease to flow for periods of the year because the bed is periodically above the water table. This category is defined by those stream reaches that do not meet the definition of permanent river or stream and meet at least three of the following criteria:

- (a) it has natural pools;
- (b) it has a well-defined channel, such that the bed and banks can be distinguished;
- (c) it contains surface water more than 48 hours after a rain event which results in stream flow;
- (d) rooted terrestrial vegetation is not established across the entire cross-sectional width of the channel;
- (e) organic debris resulting from flood can be seen on the floodplain; or
- (f) there is evidence of substrate sorting process, including scour and deposition.

ted back
:tland.

has not been purposefully constructed by mechanical means. Reverted wetlands are a type of natural wetland.

For the purposes of Rules R134, R135 and R136 only, means a river or stream that has been modified and channelled for the purpose of land drainage of surface or sub-surface water and has the following characteristics:

- it has been channelled into a single flow, and
- the channel has been straightened, and
- the channel is mechanically formed with straight or steeply angled banks, and
- it exhibits these characteristics for at least its entire length through the proportion of the watercourse in which the activity is being carried out.

Note:

To provide guidance for landowners, highly modified rivers and streams have been mapped in those parts of the region that have a high concentration of these watercourse types (see here [GIS Mapping - Watercourses](#)).

nd means a wetland (as defined in the Act) that is not:

- a wetland, regardless of its size, that is not a water body;
- a wetland, other than a wetland constructed to offset an existing or former natural inland wetland; or
- a wetland that is a water body, but does not flow all year.

within an area of pasture used for grazing; and

as vegetation cover comprising more than 50% exotic pasture species (as identified in the *National List of Exotic Pasture Species* using the *Pasture Exclusion Assessment Methodology* (see clause 1.8)); unless

the wetland is a location of a habitat of a threatened species identified under clause 3.8 of this National Policy Statement, in which case the exclusion in (e) does not apply.

It seems easy

The scientific literature indicates that (simply put):

- Rivers have channels
- Wetlands are 'wet land'

Ministry for the Environment indicates wetlands can be distinguished by

- Plants adapted to wet conditions
- Hydric soils
- Hydrological indicators



River or Wetland?



River or Wetland?



River or Wetland?



River or Wetland?



River or Wetland?



Source: Walt Dickson, Open water and lagoons — Wairarapa Moana Wetlands Project (waiwetlands.org.nz)

River or Wetland?



River or Wetland?



River or Wetland?



River or Wetland?



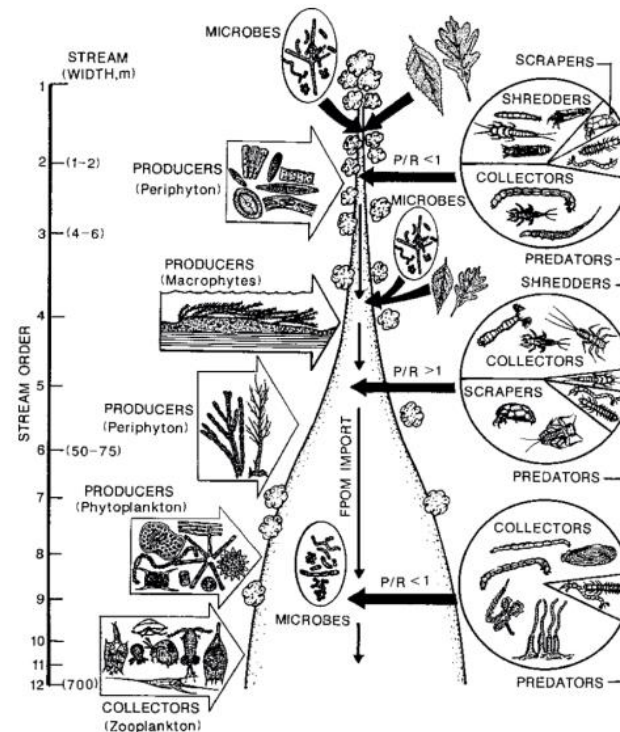
River or Wetland?



Not so easy after all

RAMSAR definition of wetland:

“For the purpose of this Convention wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres”



I. HYDROSYSTEM

(Based on broad hydrological and landform setting, salinity, temperature)



IA. SUBSYSTEM

(A descriptive level relating to water regime)

II. WETLAND CLASS

(Based on substrate, water regime, nutrients, pH)



IIA. WETLAND FORM

- Landforms which wetlands occupy (e.g. slope, basin)
- Forms which wetlands create (e.g. domed bog, string fen)
- Forms or features which wetlands contain (e.g. pool, rand)

III. STRUCTURAL CLASS

- Structure of the vegetation (e.g. forest, rushland, herbfield), or:
- Predominant ground surface (e.g. rockfield, mudflat)

IV. COMPOSITION OF VEGETATION

- One or more dominant plants (e.g. bog pine, wire rush)

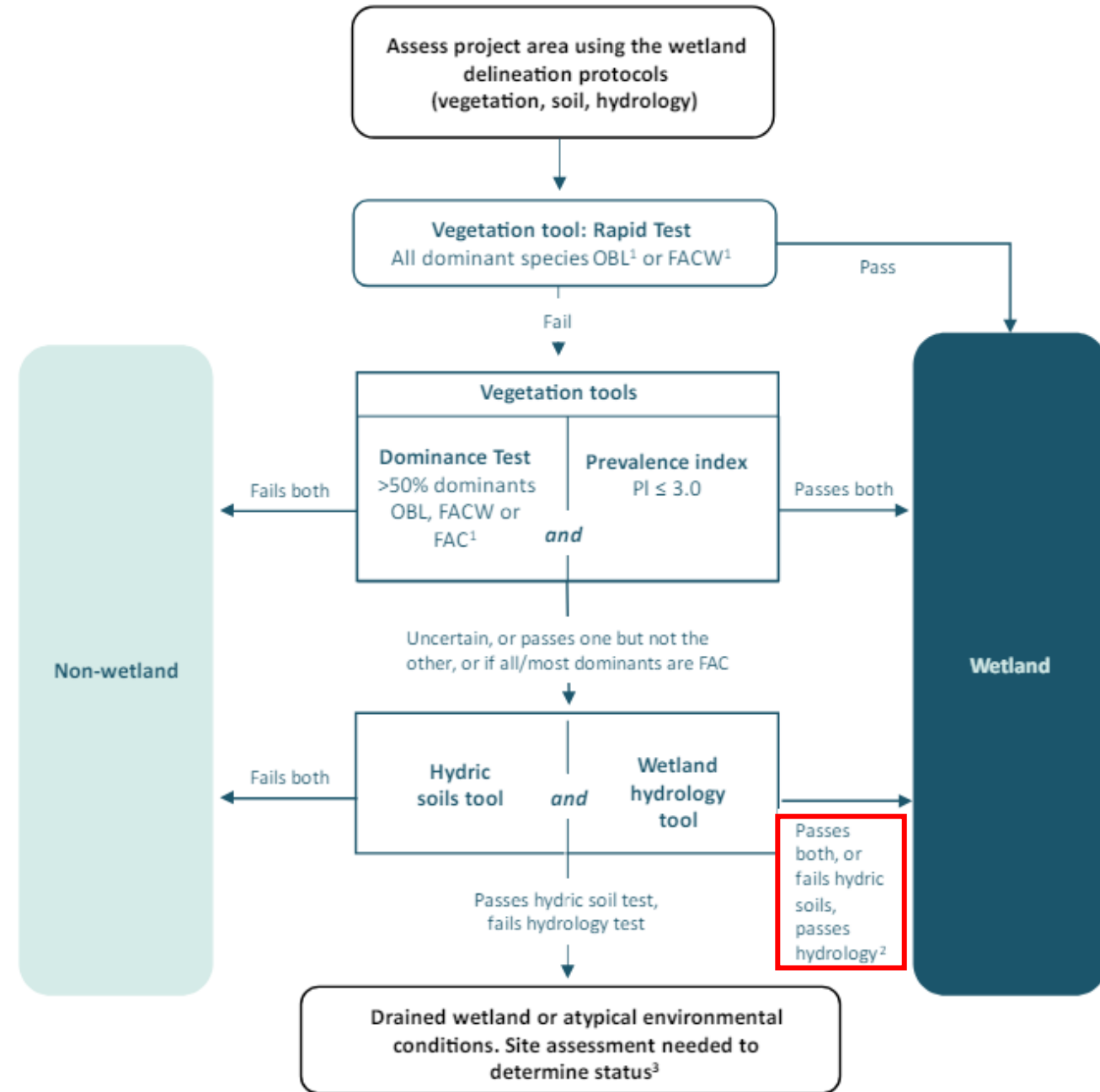
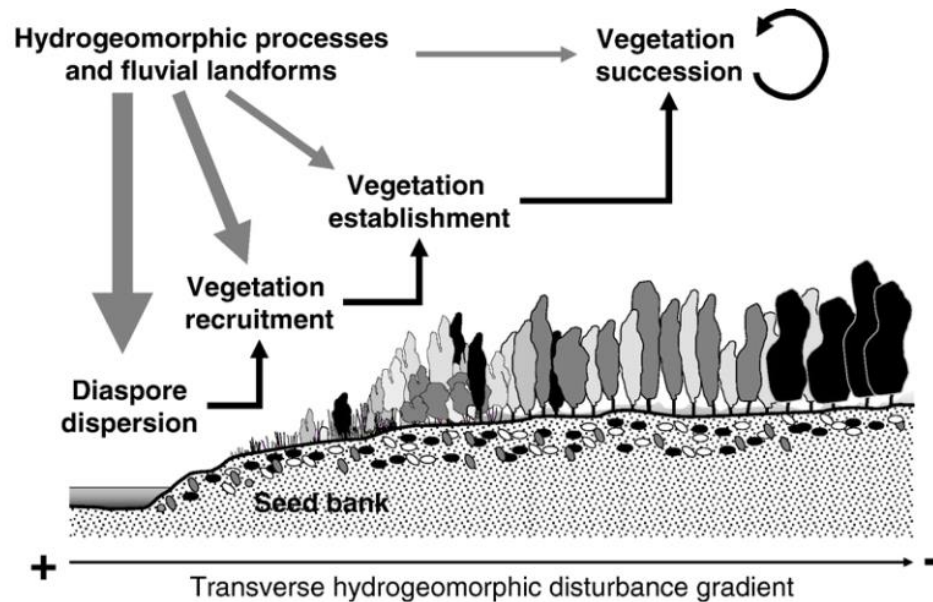
'What does the plot say'

Wetland delineation protocols – Starts with vegetation

'Wet adapted plants' like wet environments, regardless of what we call them

Disturbance can restrict vegetation transition

Disturbance can restrict hydric soil development



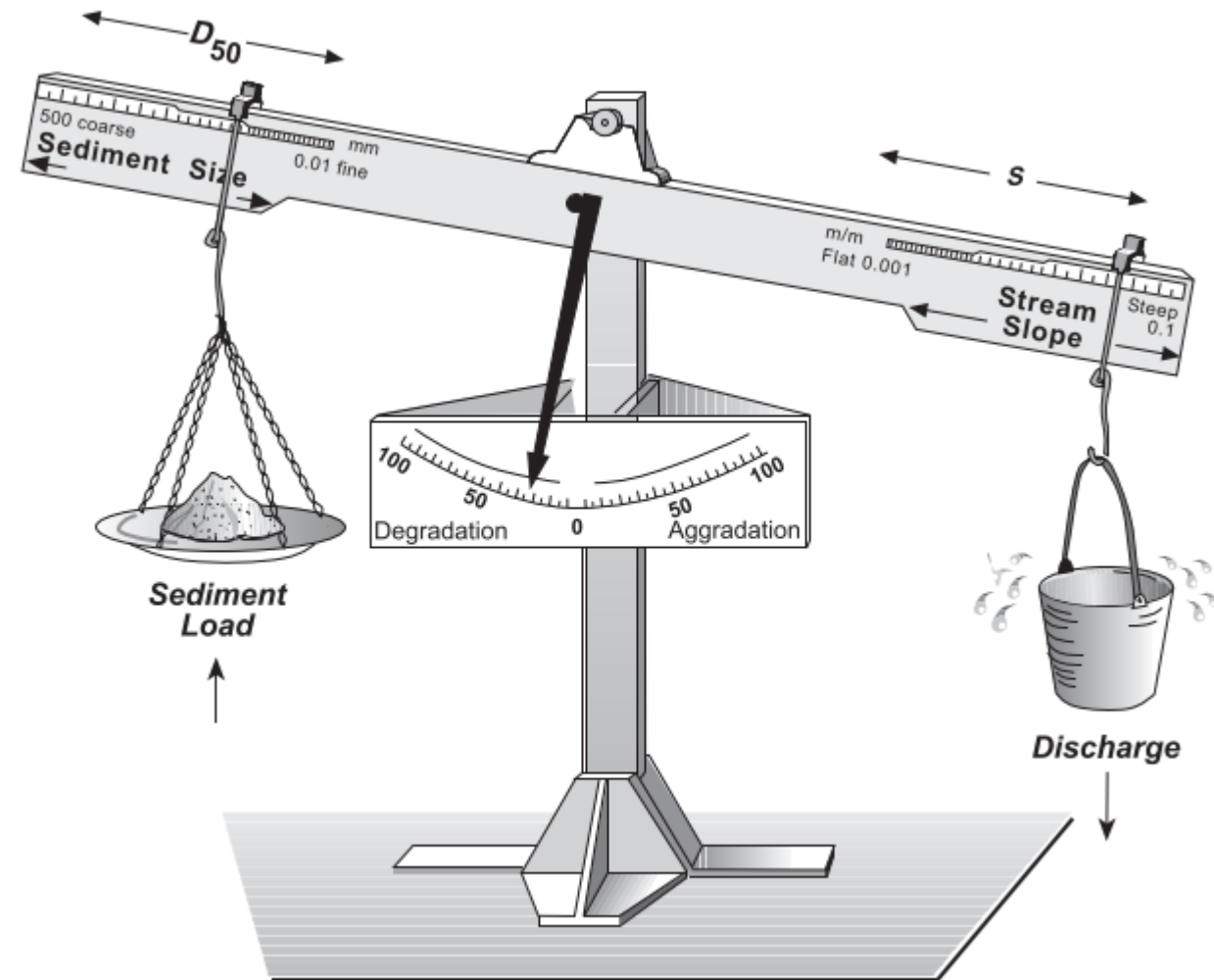
The energy continuum

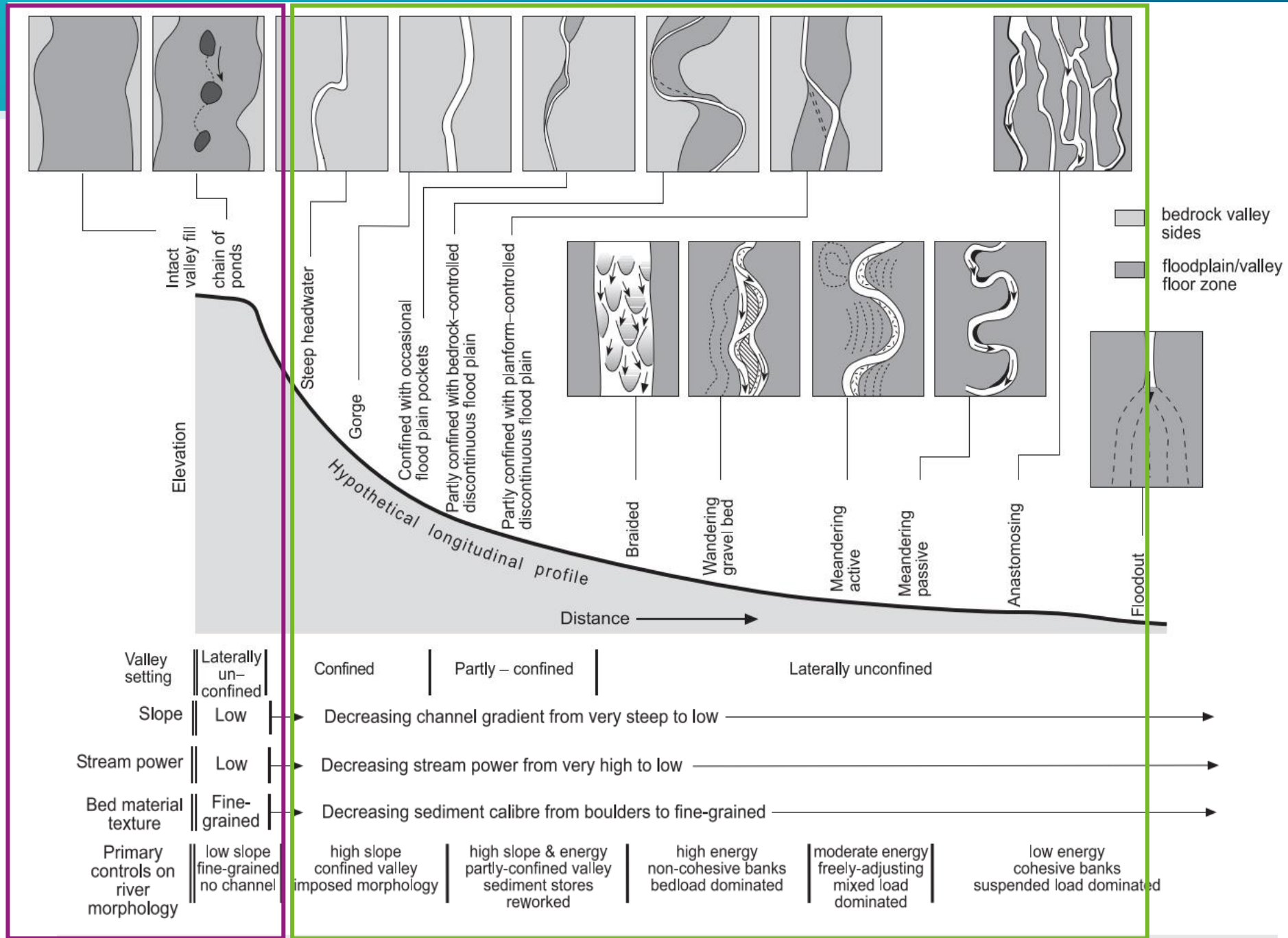
Fluvial forms a result of how sediment is moved by water

Critical energy threshold needs to be reached for sediment to be moved by water

Energy deficit = sediment deposition = Wetland?

Energy surplus = sediment transport = River?





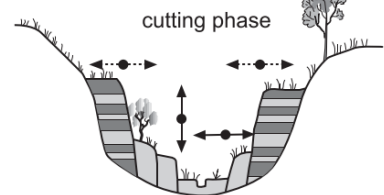
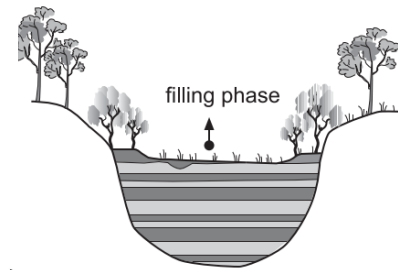
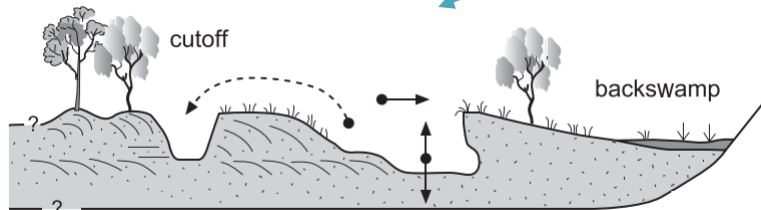
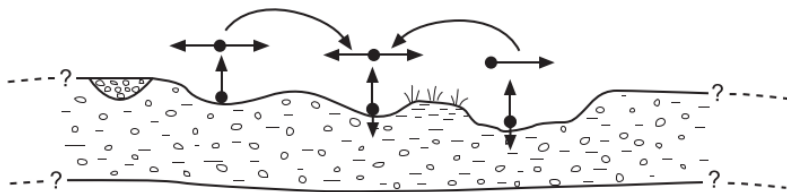
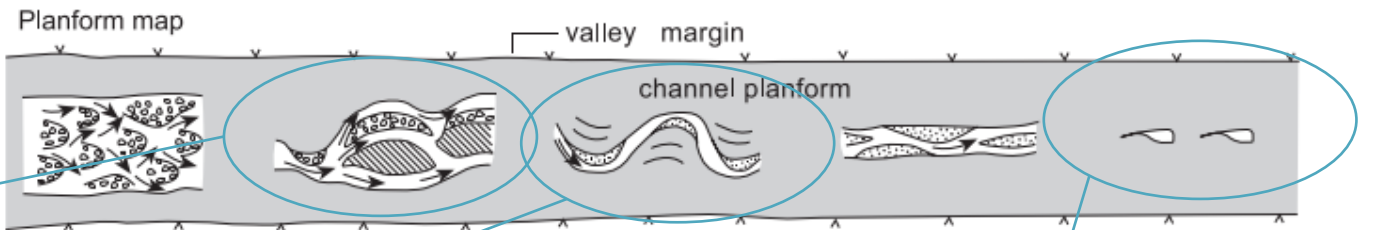
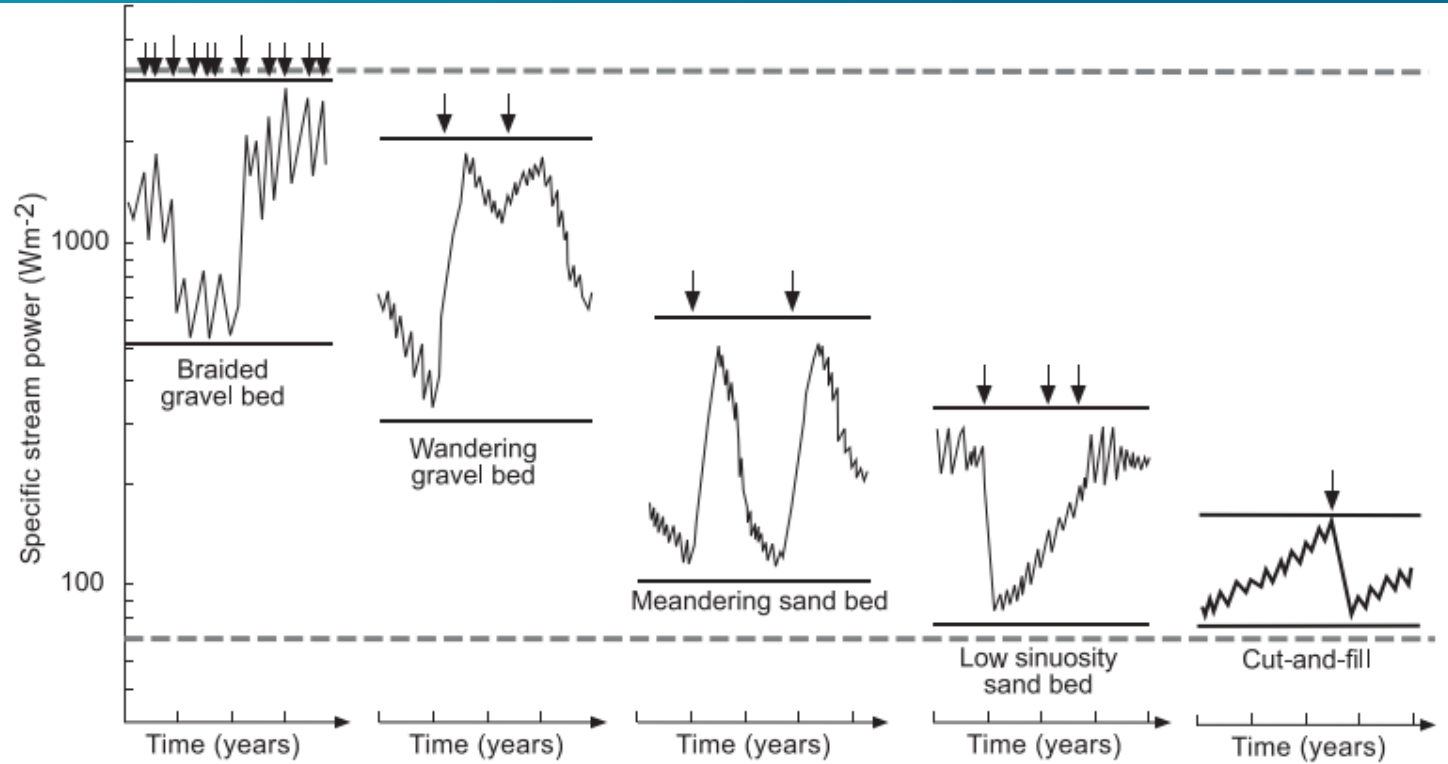
Stationarity?

Systems adjust through space and time

Minor changes to the system may induce dramatic changes in the form of the system

Some changes may take a long time to manifest

Some occur rapidly



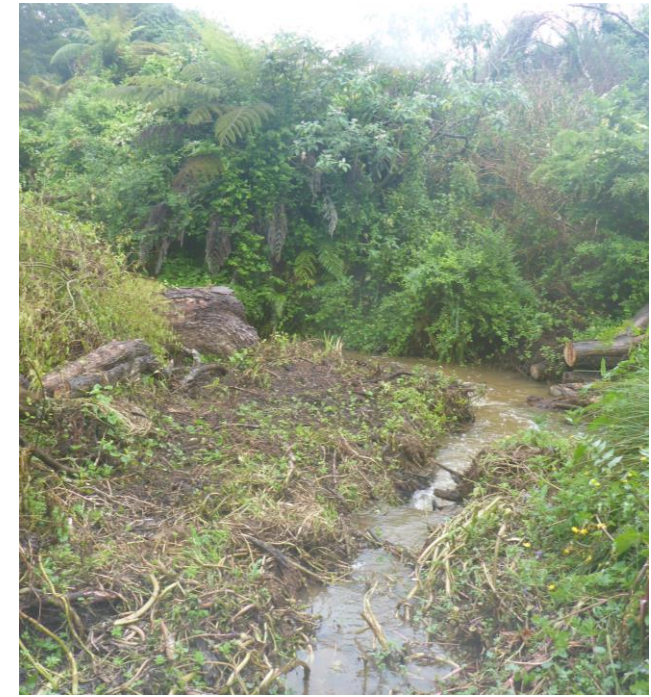
Reversion of system form

Willow 'wetlands'

Often low energy streams that have aggraded in response to willows

Reversion of form can be rapid

River....or wetland....?



Why does it matter?



Understanding system through time and space = appropriate design = resilient development



System context where arbitrary definitions may not fit



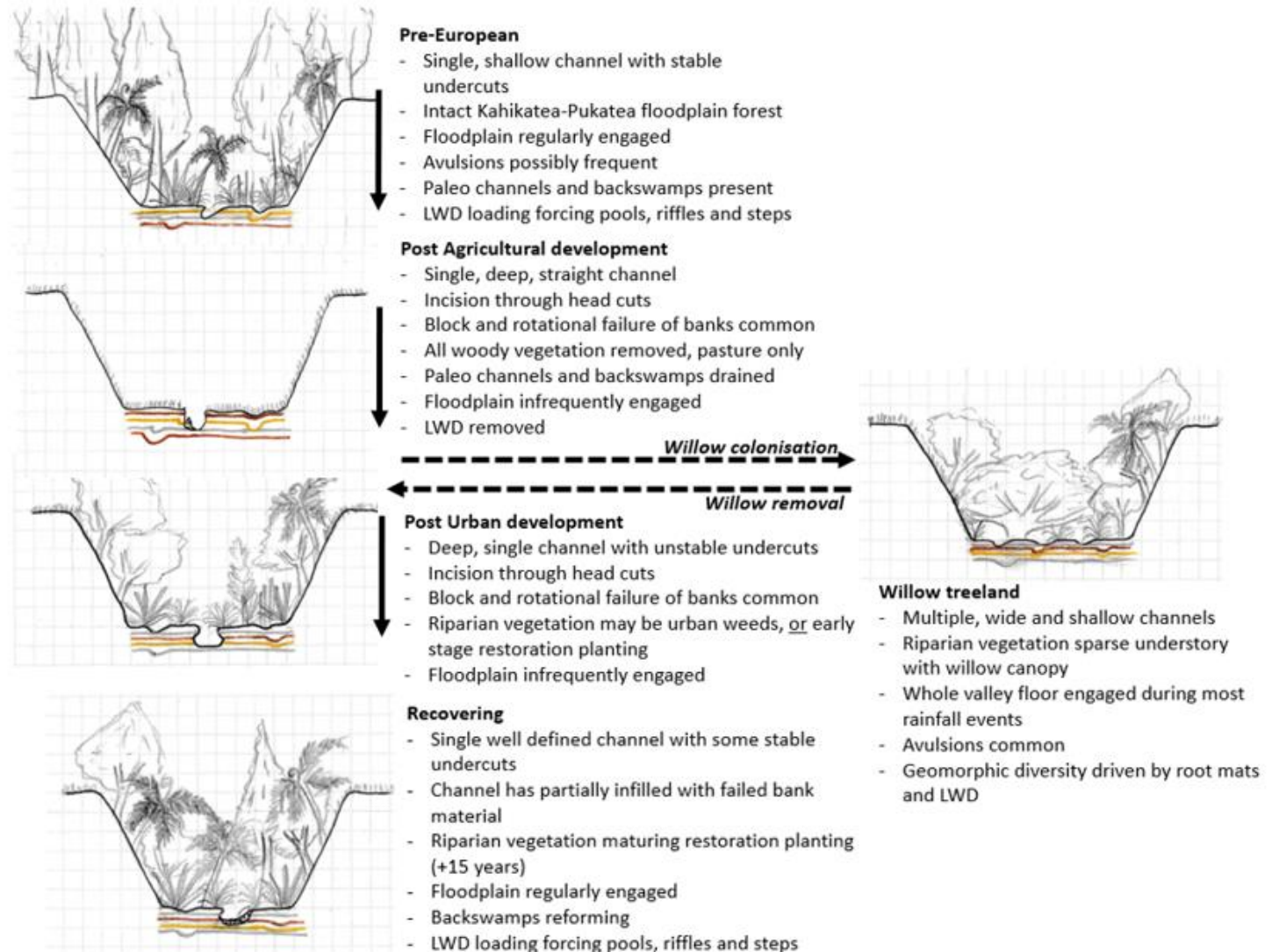
Don't fight the site, use it to your advantage

Nature based solutions

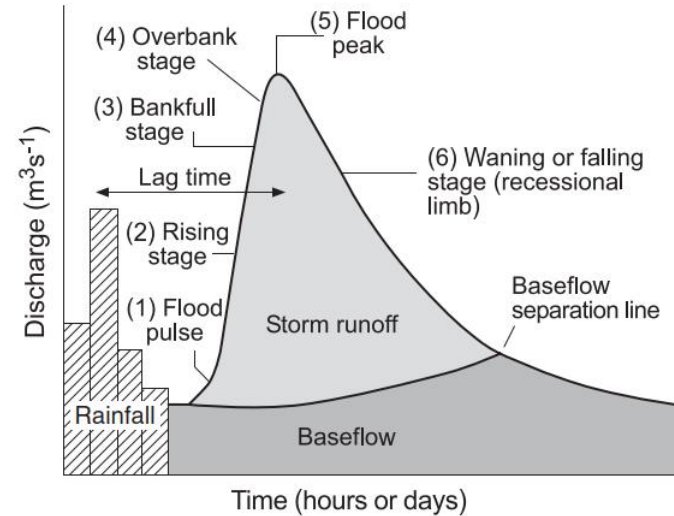
Put the 'nature' into Nature Based Solution

Form + Function + Evolution + Response = Implications of development design

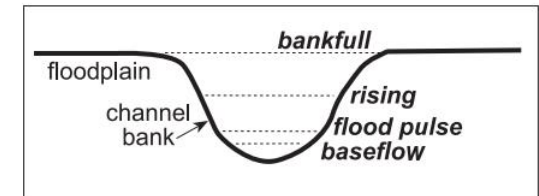
Prompts for consideration – the implications of which depend on your environment



Maintaining baseflows



within channel flows



overbank flows

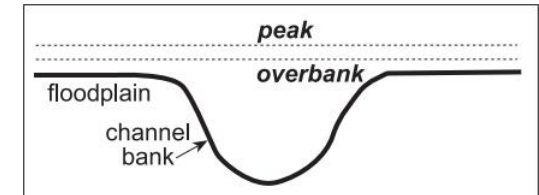


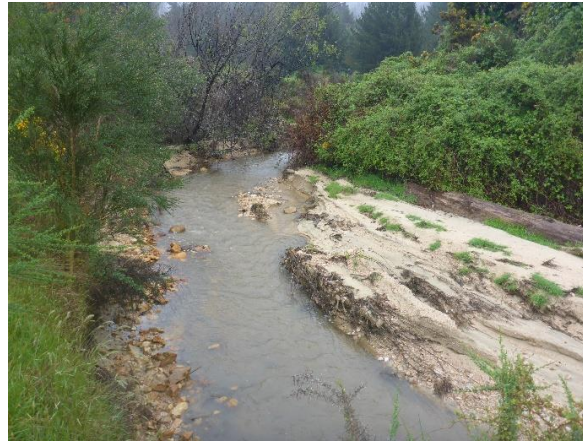
Figure 4.12 Flow stages on a hydrograph. Flow is often lagged behind the most intense phases of rainfall because of infiltration and throughflow effects. Lag time is measured as the time between peak rainfall and peak discharge. Storm runoff occurs when discharge increases above the baseflow condition. Six stages of flood flow are differentiated on the hydrograph and as flow through channel cross-sections.

Communal devices



Sediment regime

- Sediment movement is essential
- Development =
 - Reduced sediment generation
 - Modified hydrological regime
 - Sediment based treatment approach
- What does this changed sediment regime mean for your site?



If it's wet, it's something

Nature doesn't fit into perfectly defined boxes

Science remains despite legislative definitions

Ask for more than just 'wetland delineation' or 'river classification'

Spend time on site and get the experts there early

Understand how the 'thing' behaves, rather than just its label

This is something we can all do better



Environmental Consulting Professionals

R. George Hummeldorf, MS, PG • 2nd

2h •

Want to keep up with the latest waters of the US (WOTUS) and wetland regulations? Contact UES (Geotechnology). We offer wetland delineations, US Army Corps of Engineering permitting, and threatened and endangered species assessments! #ues #geotechnology #wetlands #wotus #usace #permitting #NWP #covingtonbusinesscouncil #CREW #ULI #AEG

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Thank you. Questions? Patai?