

PRESSURES ON IRISH FRESHWATER RESOURCES: PRESENT & FUTURE



ESMANAGE WORKSHOP

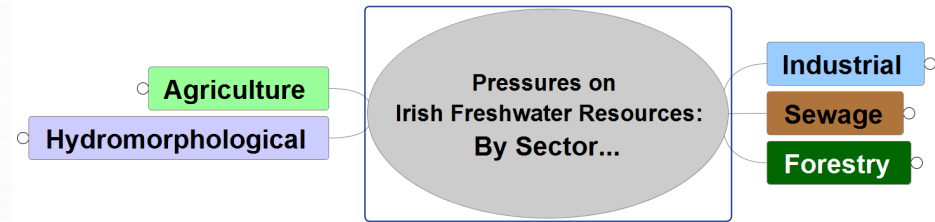
UCD, 31 AUGUST 2015

MARTIN MCGARRIGLE

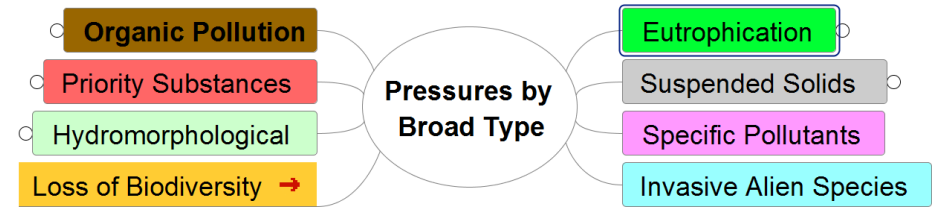
LIMNOS CONSULTANCY

OVERVIEW

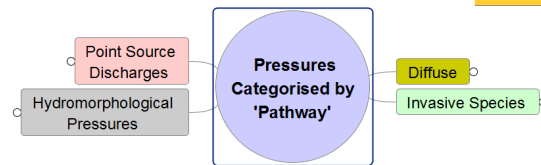
- **PRESSURES BY SECTOR**



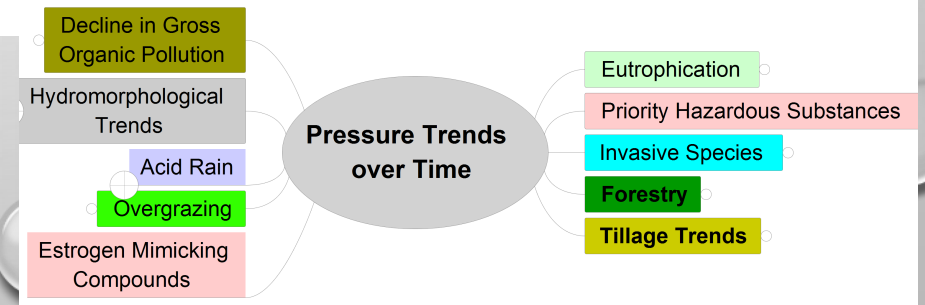
- **PRESSURES BY POLLUTANT OR OTHER PRESSURE TYPE**



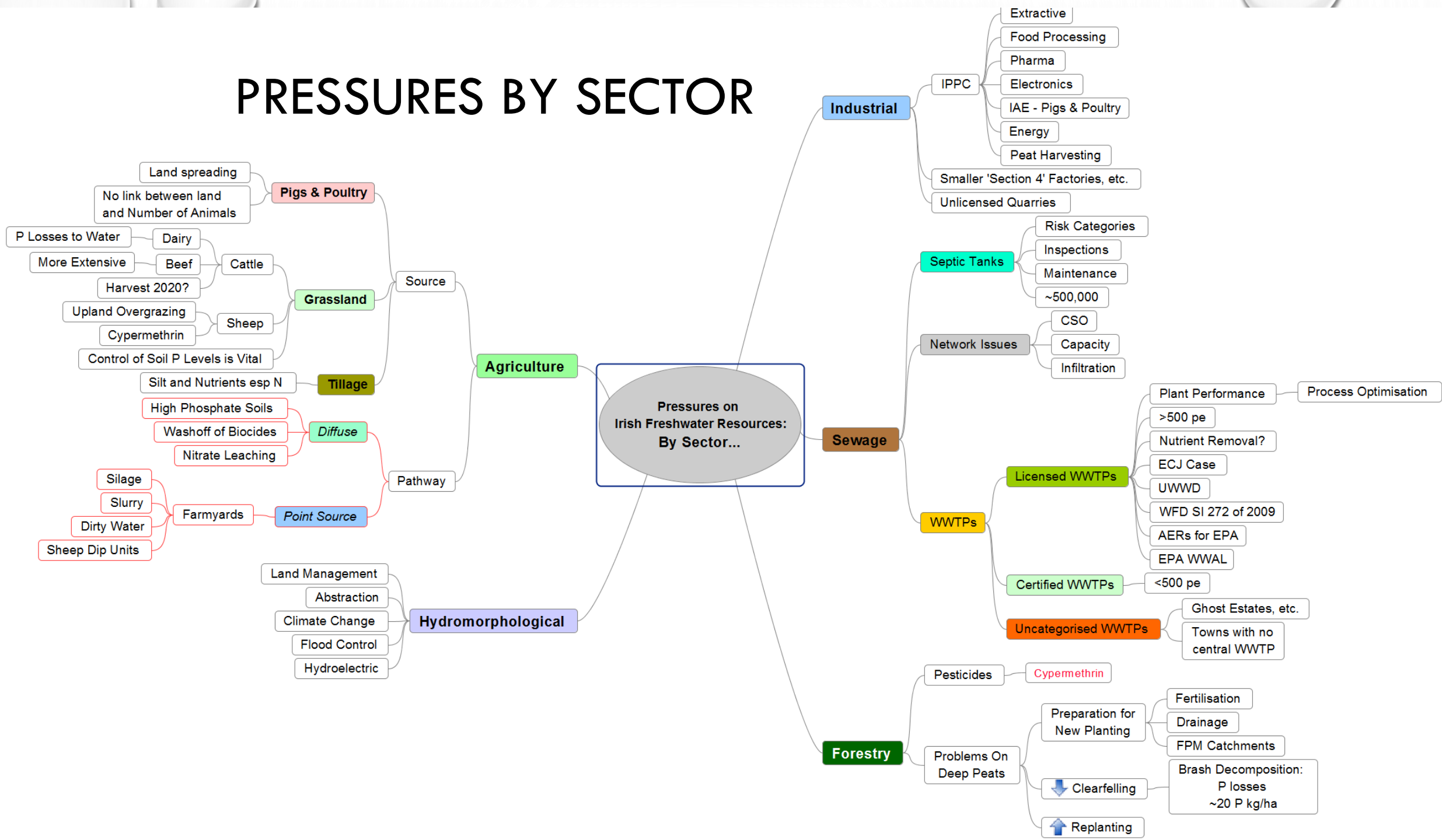
- **PRESSURES BY PATHWAY**



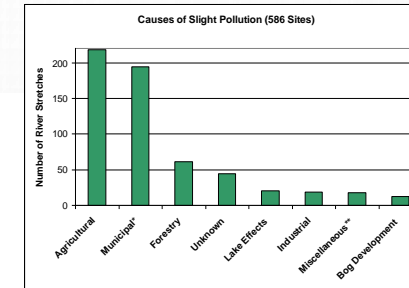
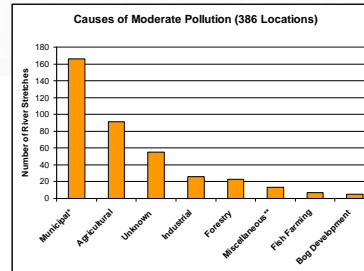
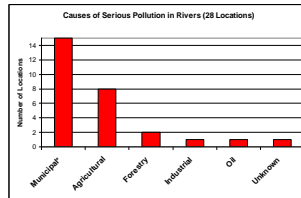
- **PRESSURES OVER TIME (IF TIME ALLOWS)**



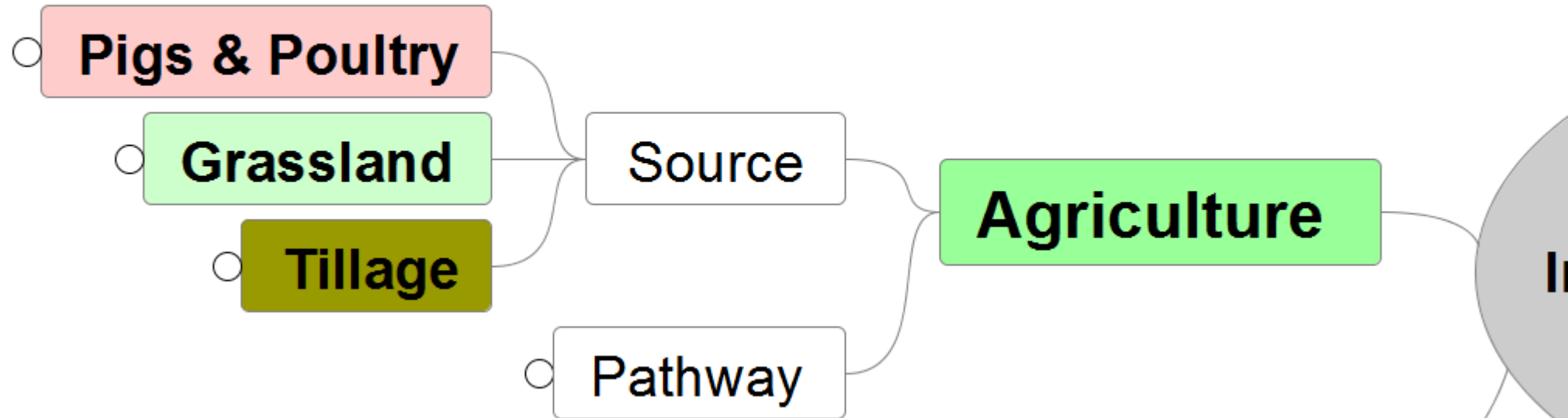
PRESSURES BY SECTOR



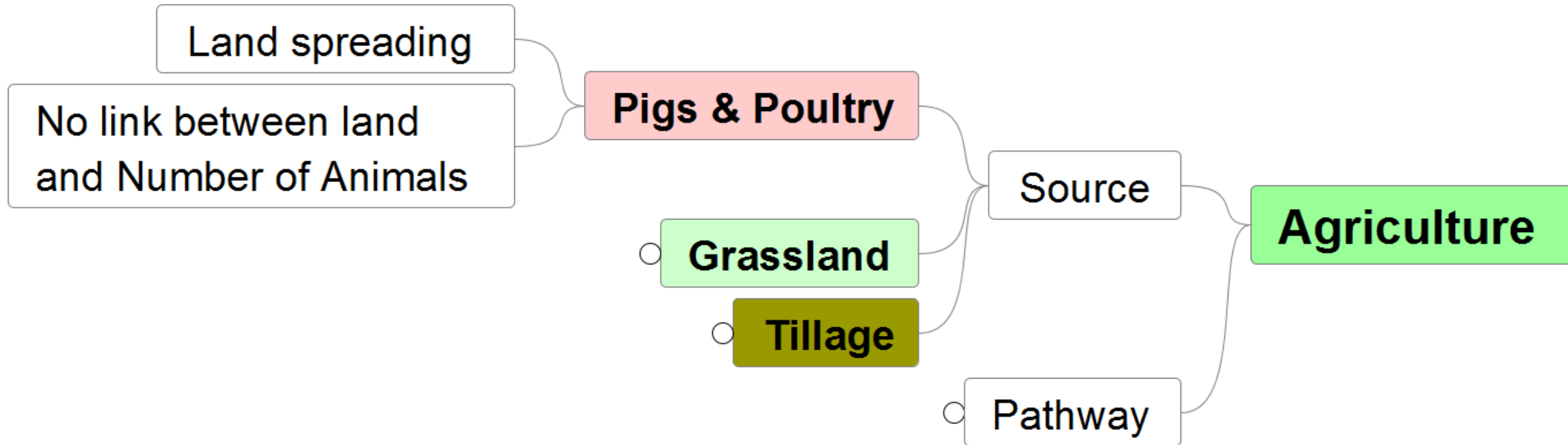
PRESSURES BY SECTOR



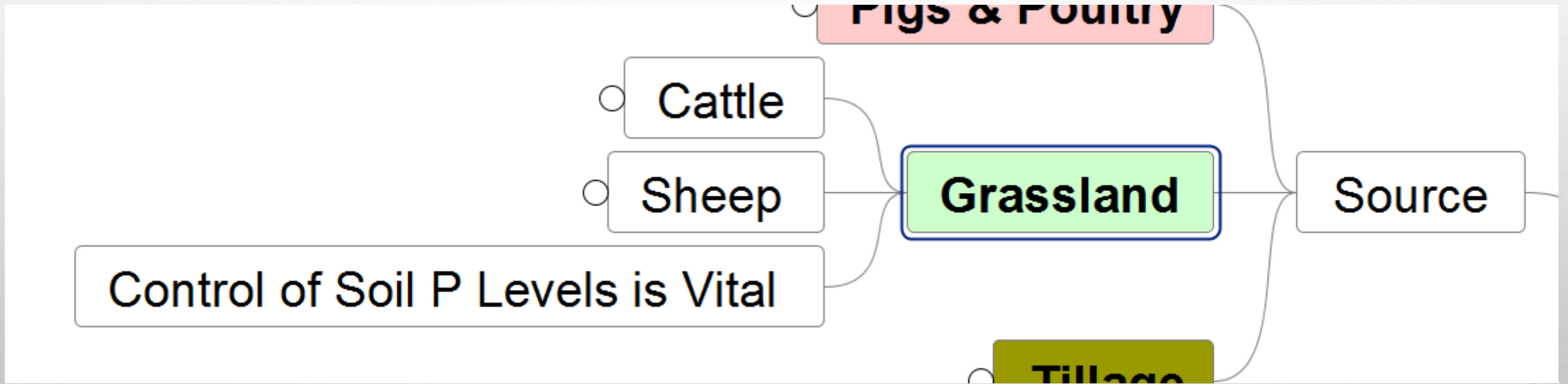
PRESSURES BY SECTOR - AGRICULTURE



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PRESSURES BY SECTOR - AGRICULTURE



P Losses to Water

Dairy

More Extensive

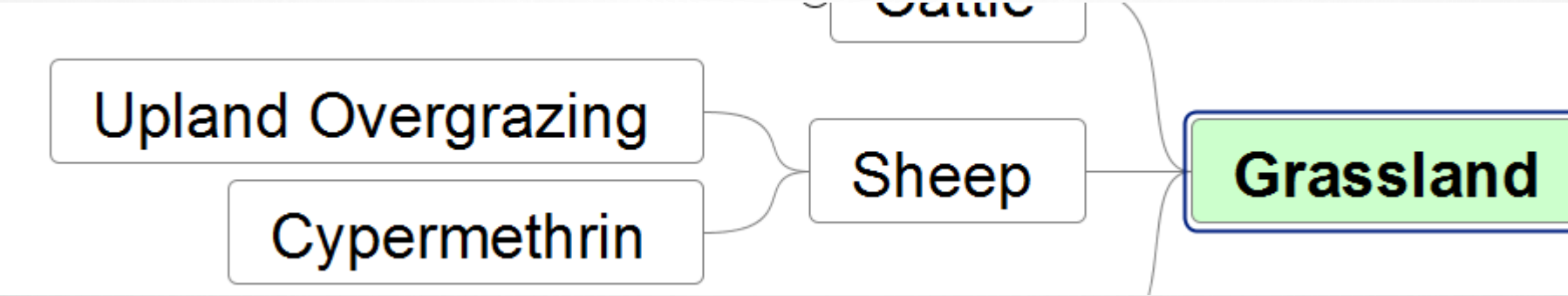
Beef

Harvest 2020?

Cattle



PRESSURES BY SECTOR - AGRICULTURE

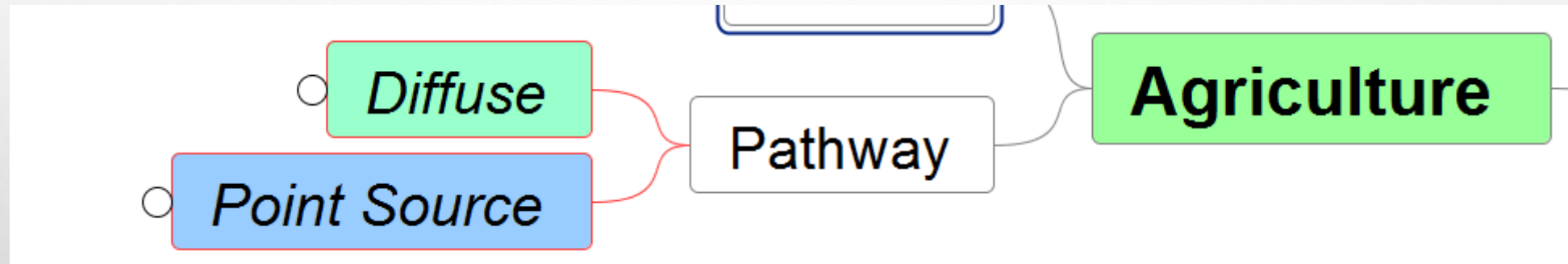


PRESSURES BY SECTOR - AGRICULTURE

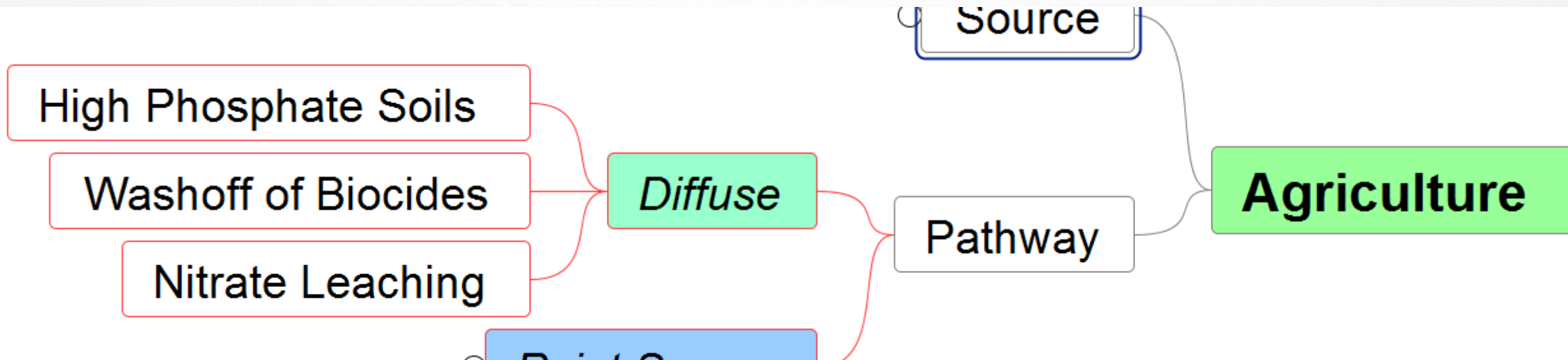
Silt and Nutrients esp N

Tillage

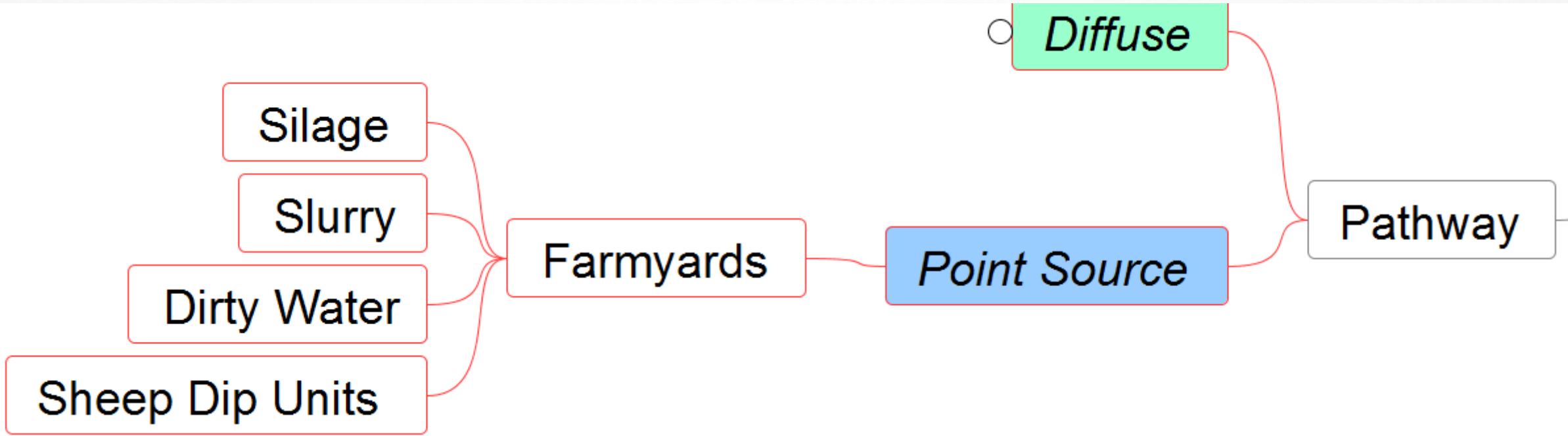
PRESSURES BY SECTOR - AGRICULTURE



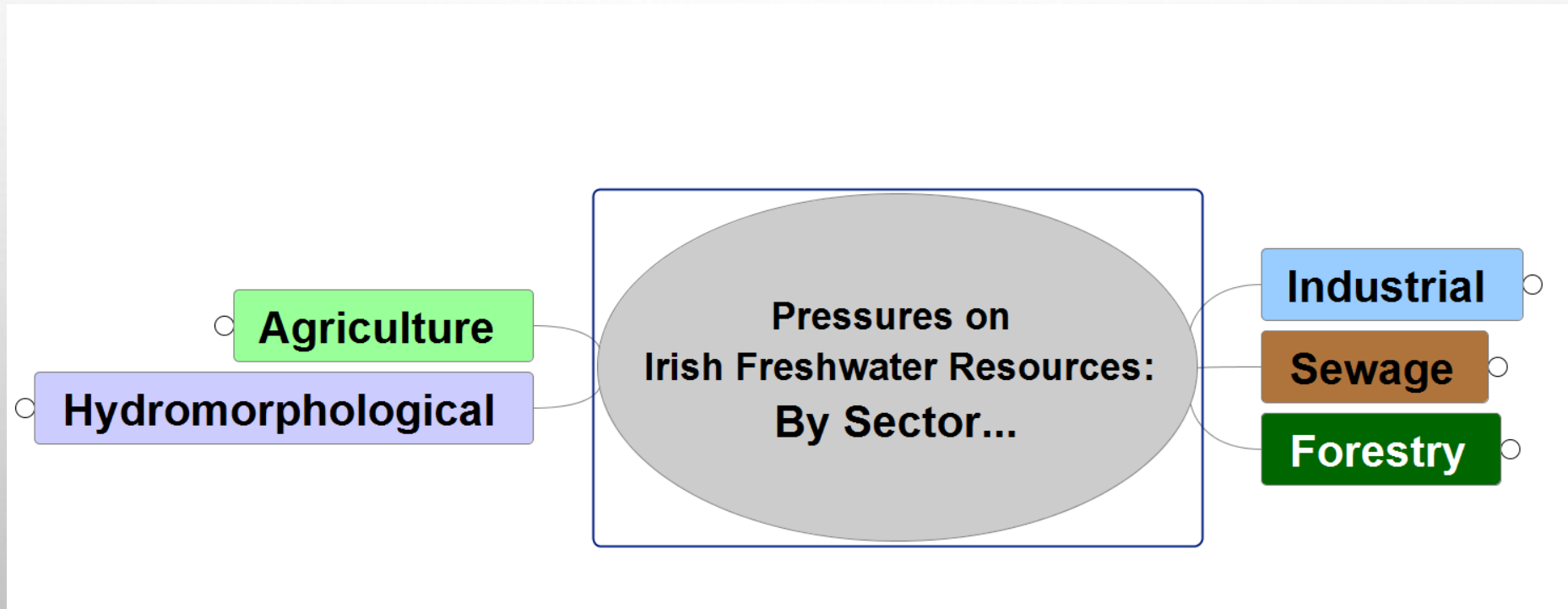
PRESSURES BY SECTOR - AGRICULTURE



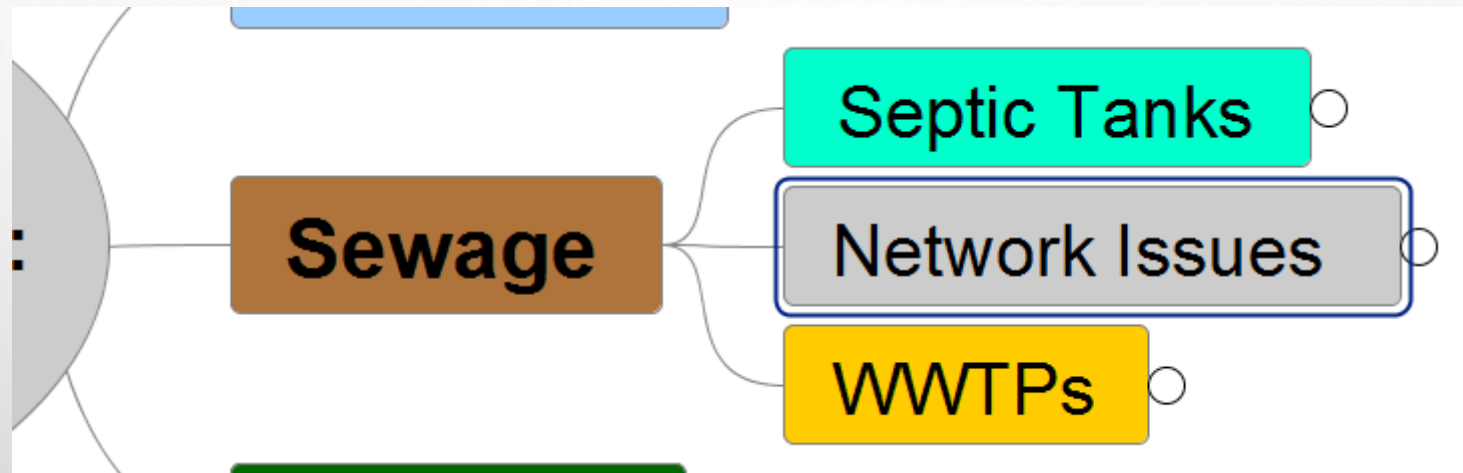
PRESSURES BY SECTOR - AGRICULTURE



PRESSURES BY SECTOR



PRESSURES BY SECTOR – WWTPS & SEPTIC TANKS



Sewage

WWTPs

Licensed WWTPs

Plant Performance

>500 pe

Nutrient Removal?

ECJ Case

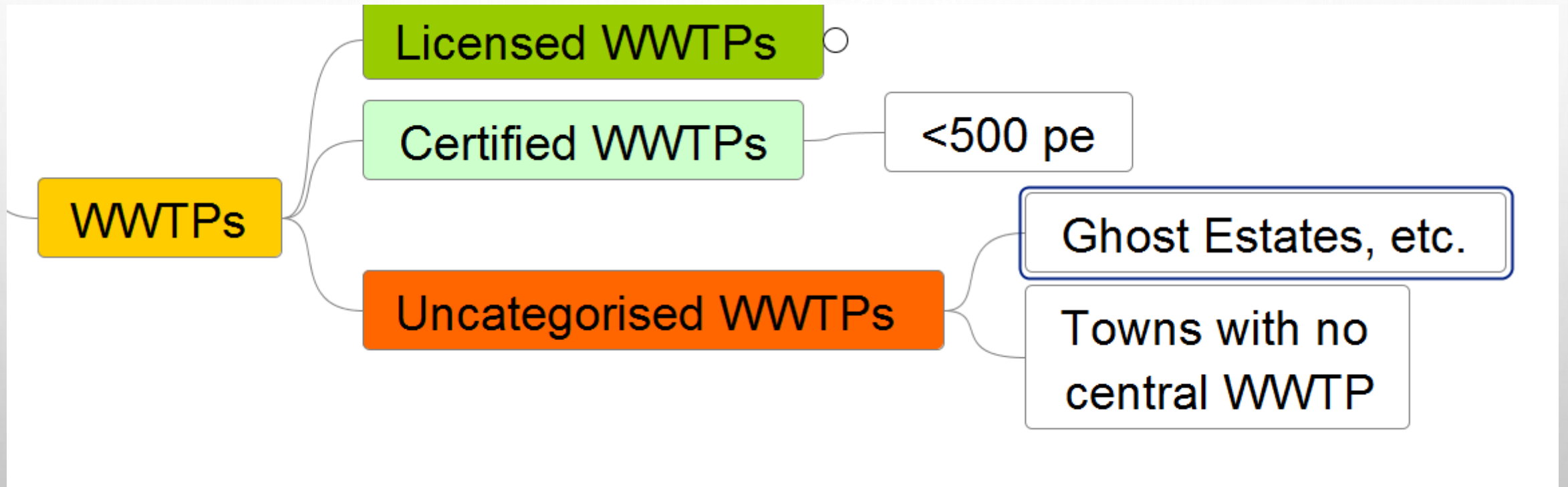
UWWD

WFD SI 272 of 2009

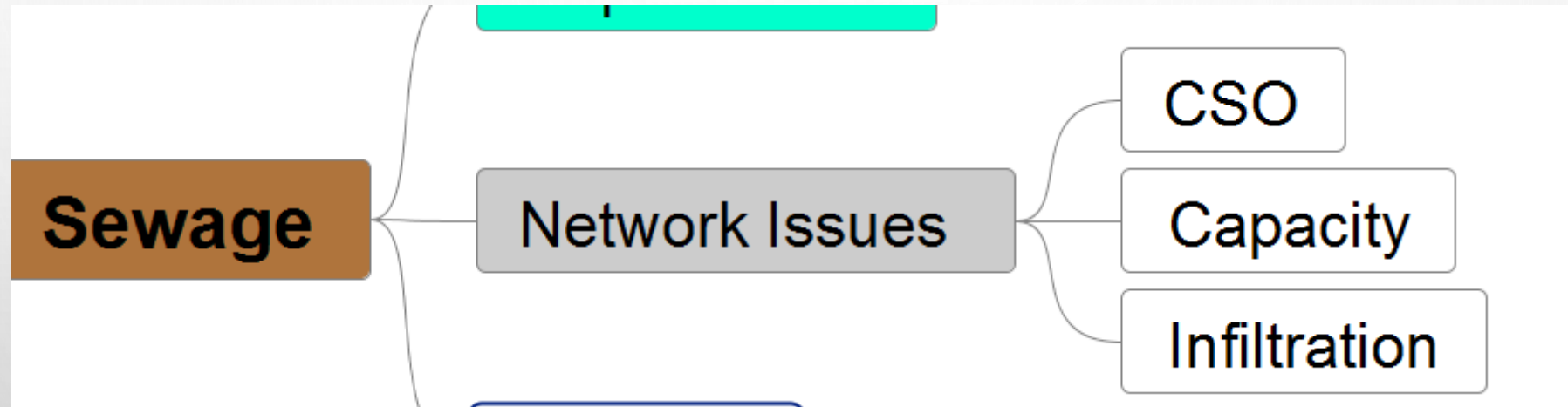
AERs for EPA

EPA WWAL

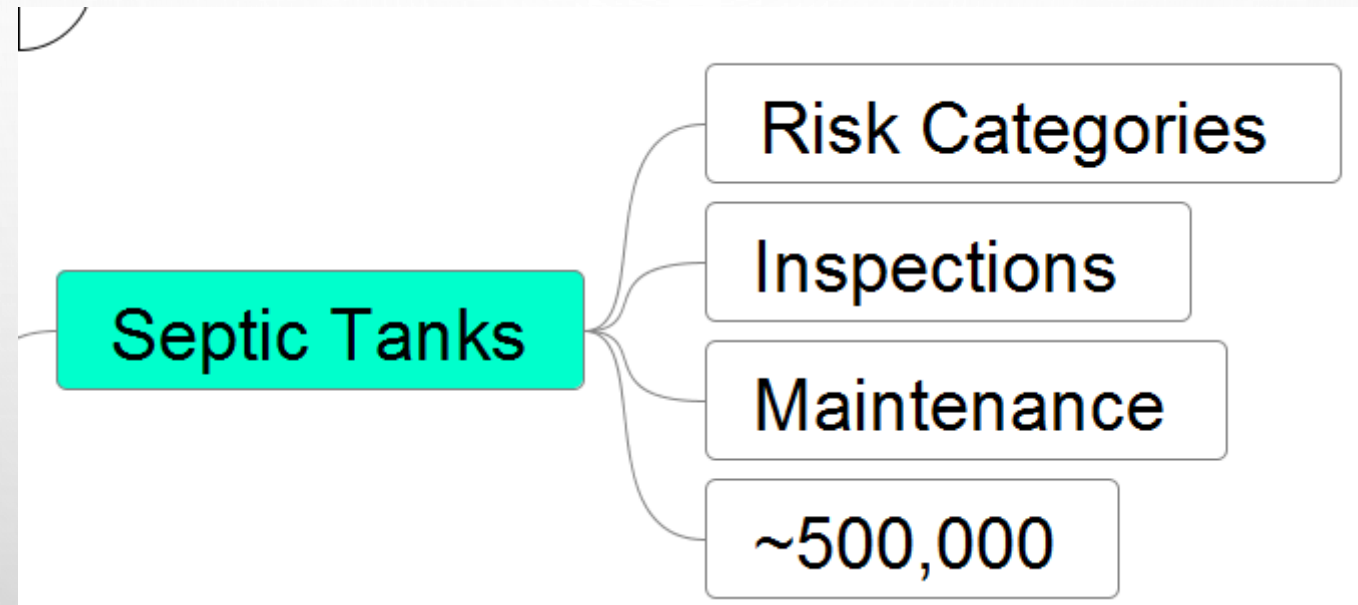
PRESSURES BY SECTOR – WWTPS & SEPTIC TANKS



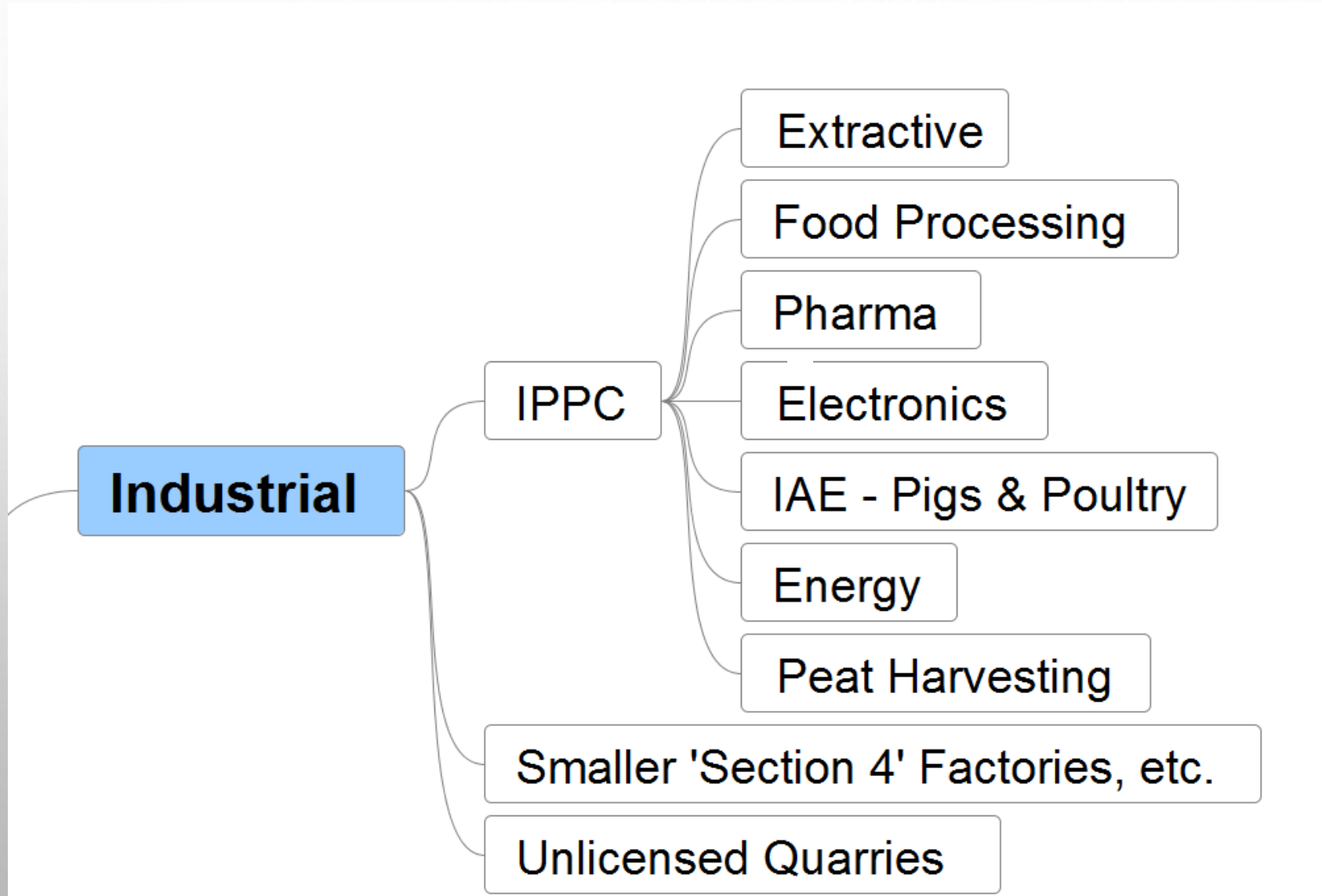
PRESSURES BY SECTOR – WWTPS & SEPTIC TANKS



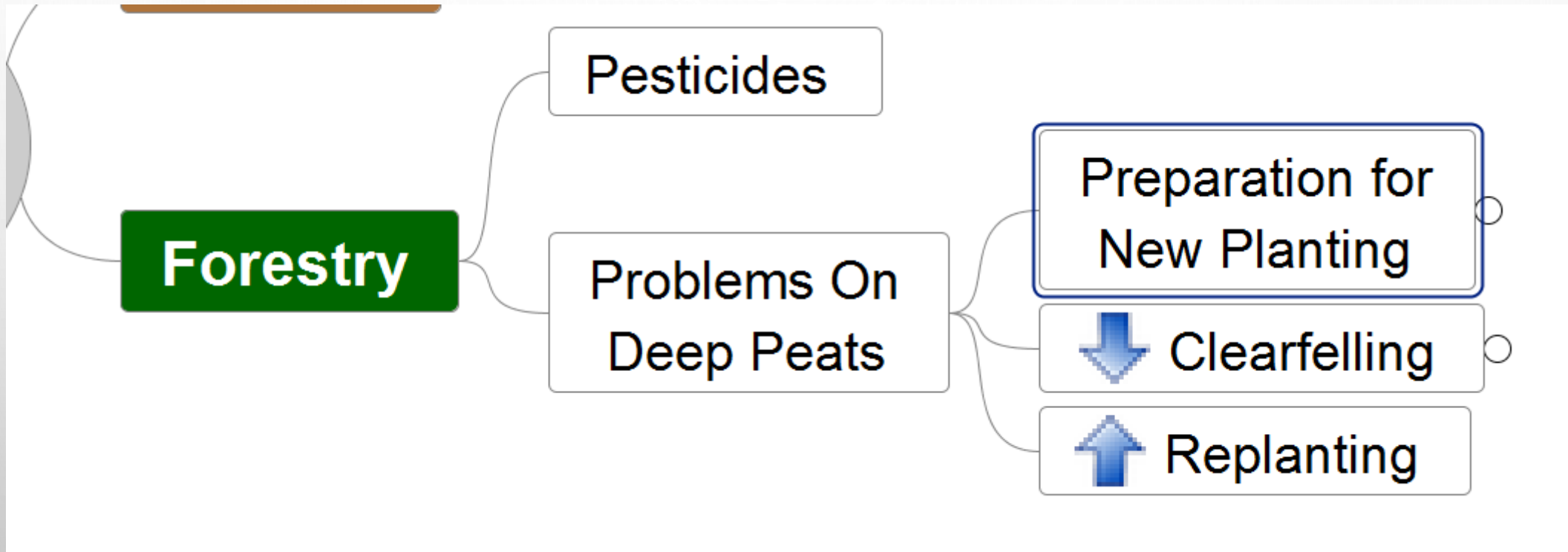
PRESSURES BY SECTOR – WWTPS & SEPTIC TANKS



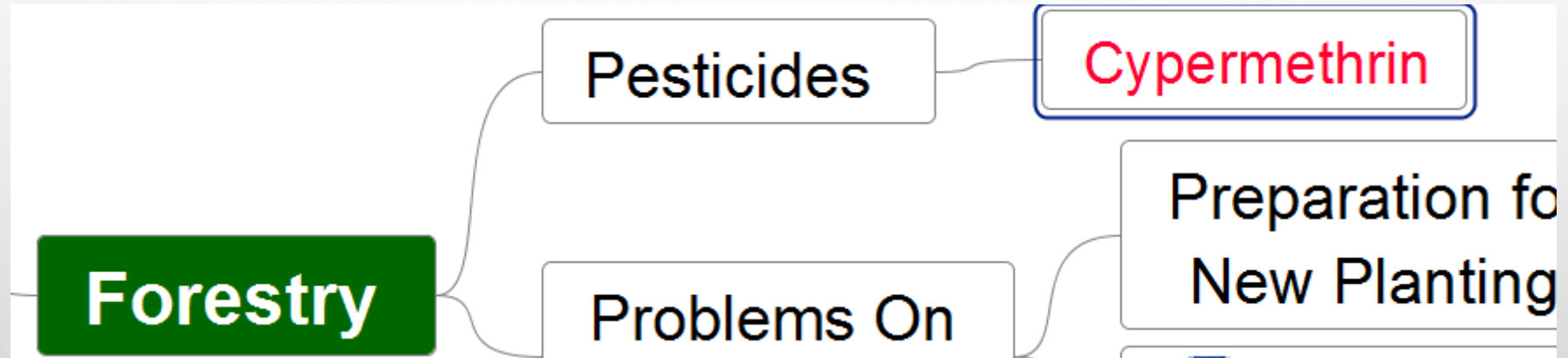
PRESSURES BY SECTOR – INDUSTRIAL



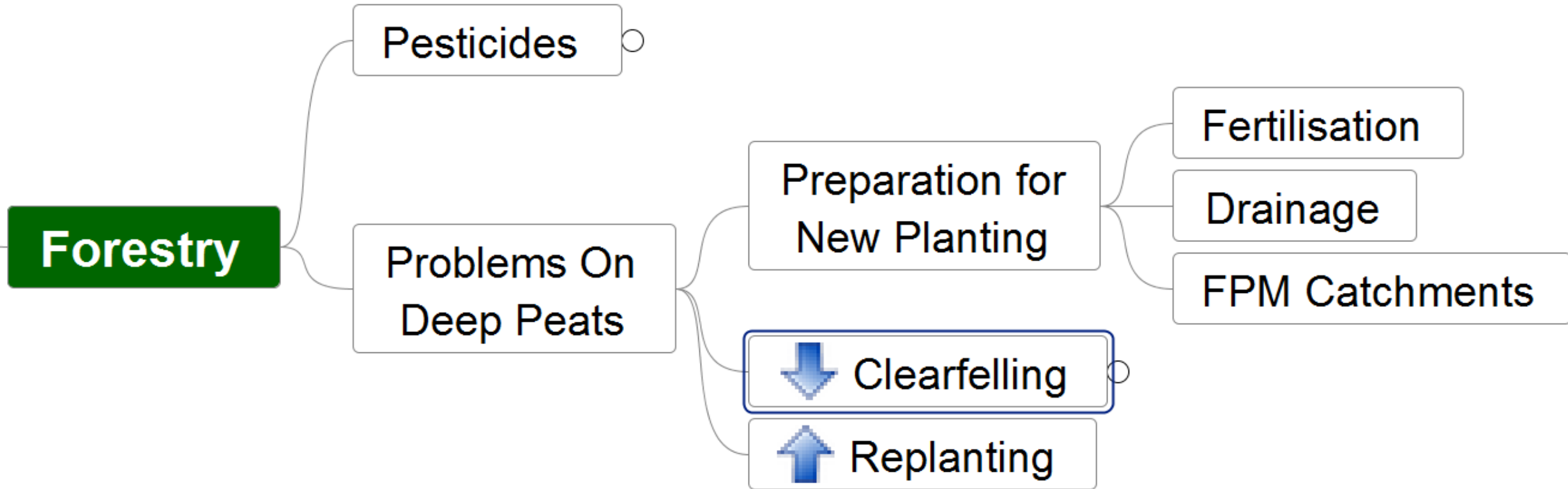
PRESSURES BY SECTOR – FORESTRY



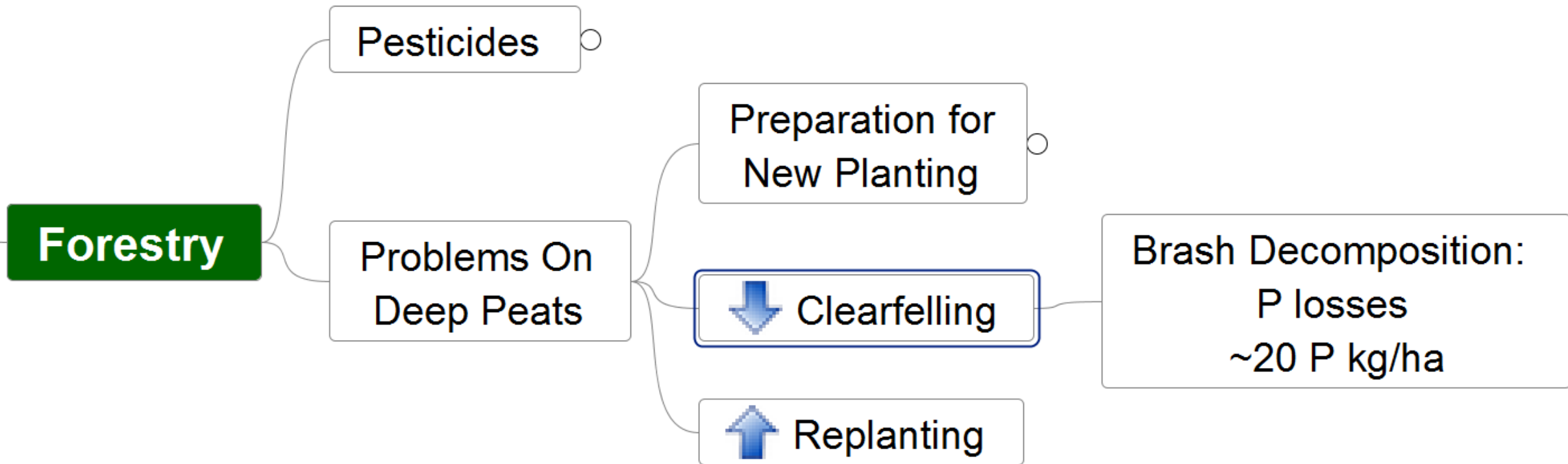
PRESSURES BY SECTOR – FORESTRY



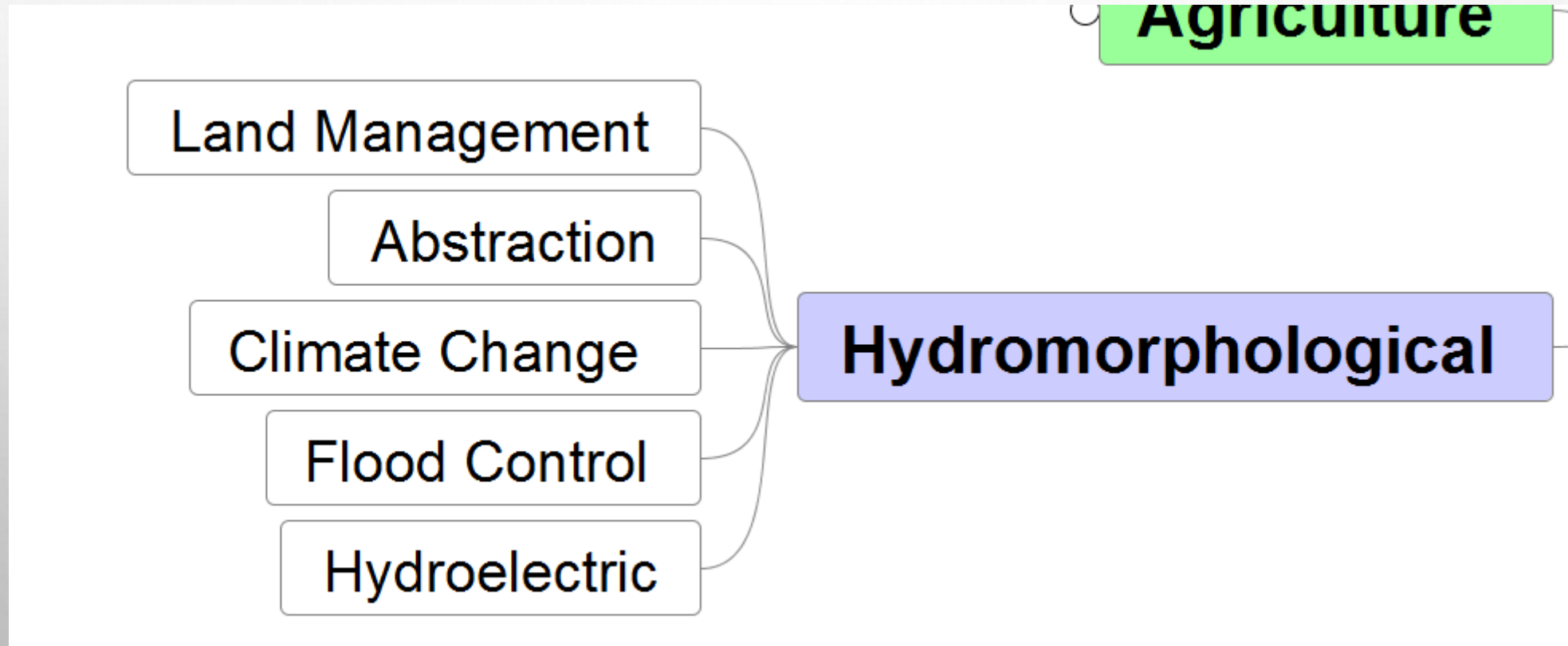
PRESSURES BY SECTOR – FORESTRY



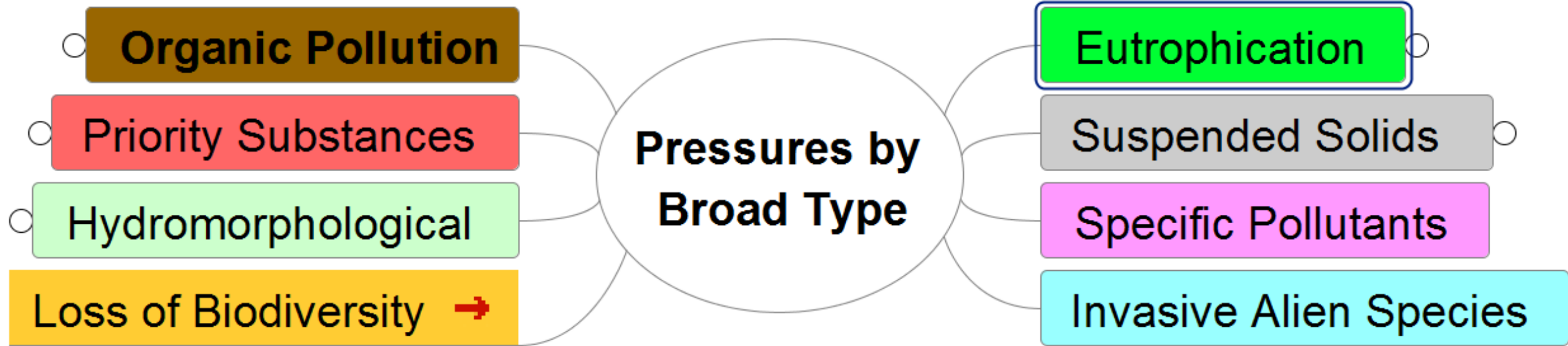
PRESSURES BY SECTOR – FORESTRY



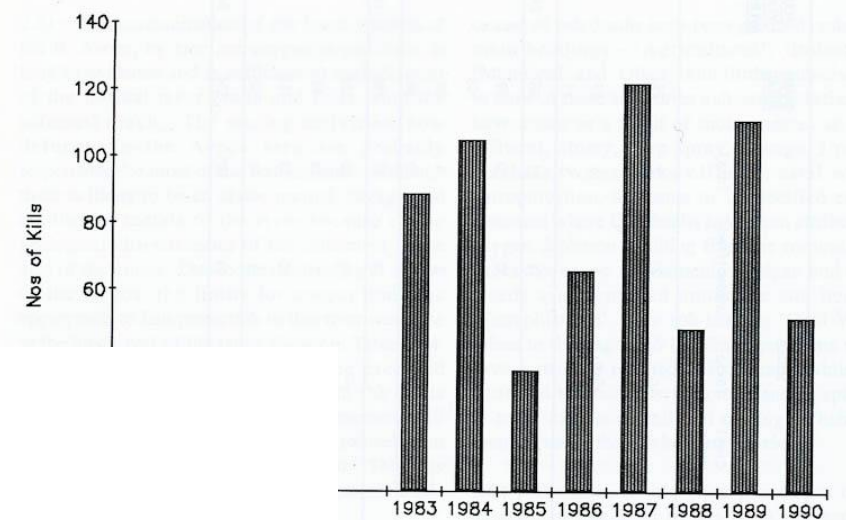
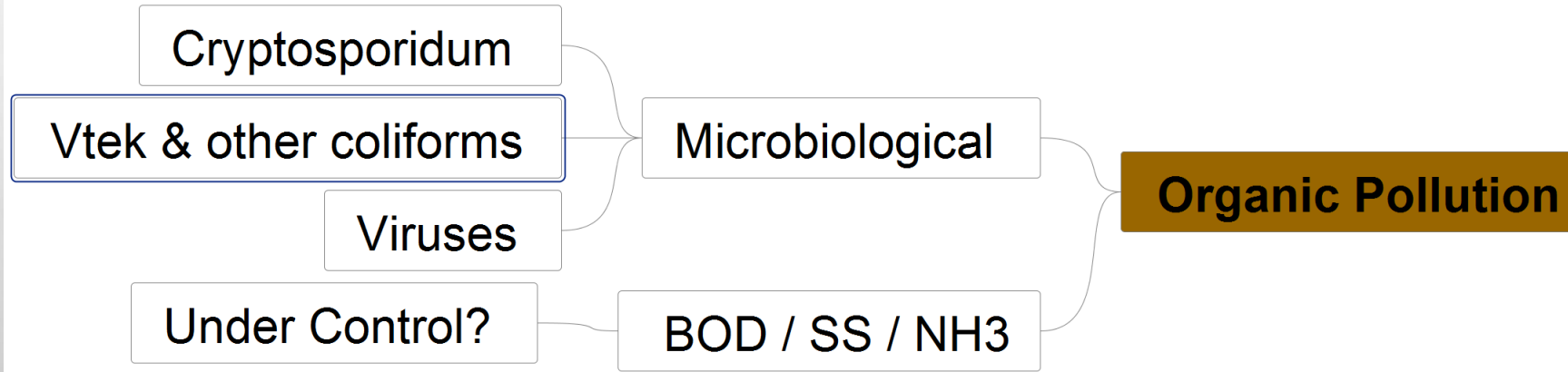
PRESSURES BY SECTOR - HYDROMORPHOLOGICAL



PRESSURES ON FRESHWATER BY TYPE OF PRESSURE



PRESSURES BY TYPE: ORGANIC POLLUTION



ills reported annually in the years 1971-1974 and 1983-1990.

Kills Peak 1980s

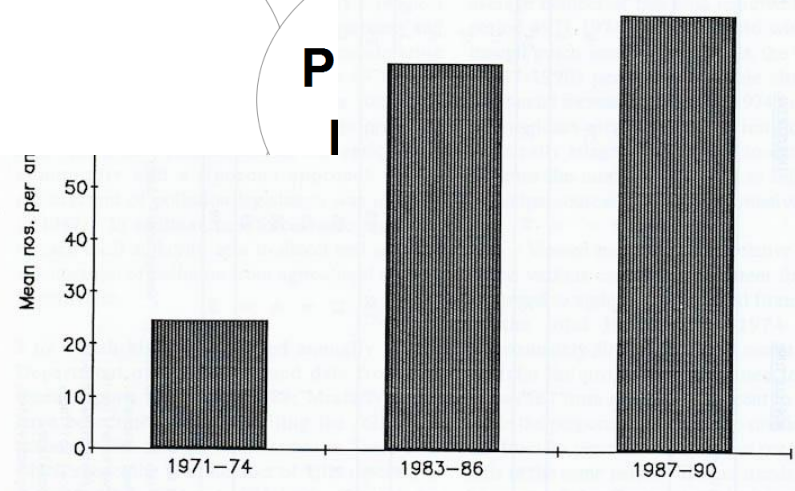


Fig. 2.8 Mean annual numbers of fish kills reported in the periods 1971-1974, 1983-1986 and 1987-1990.

PRESSURES BY TYPE: EUTROPHICATION



Eutrophication

Still with us
but improving

Some good trends

Vigilance Needed
e.g. Harvest 2020



PRESSURES BY TYPE: EUTROPHICATION

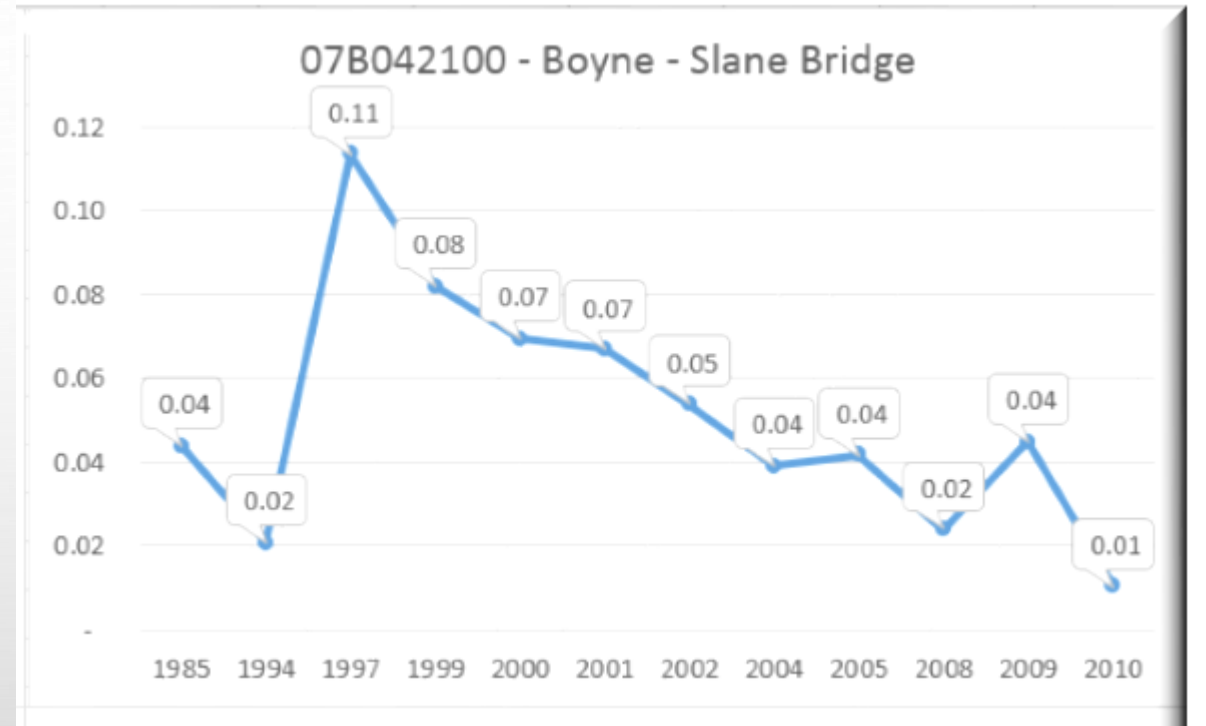


Eutrophication

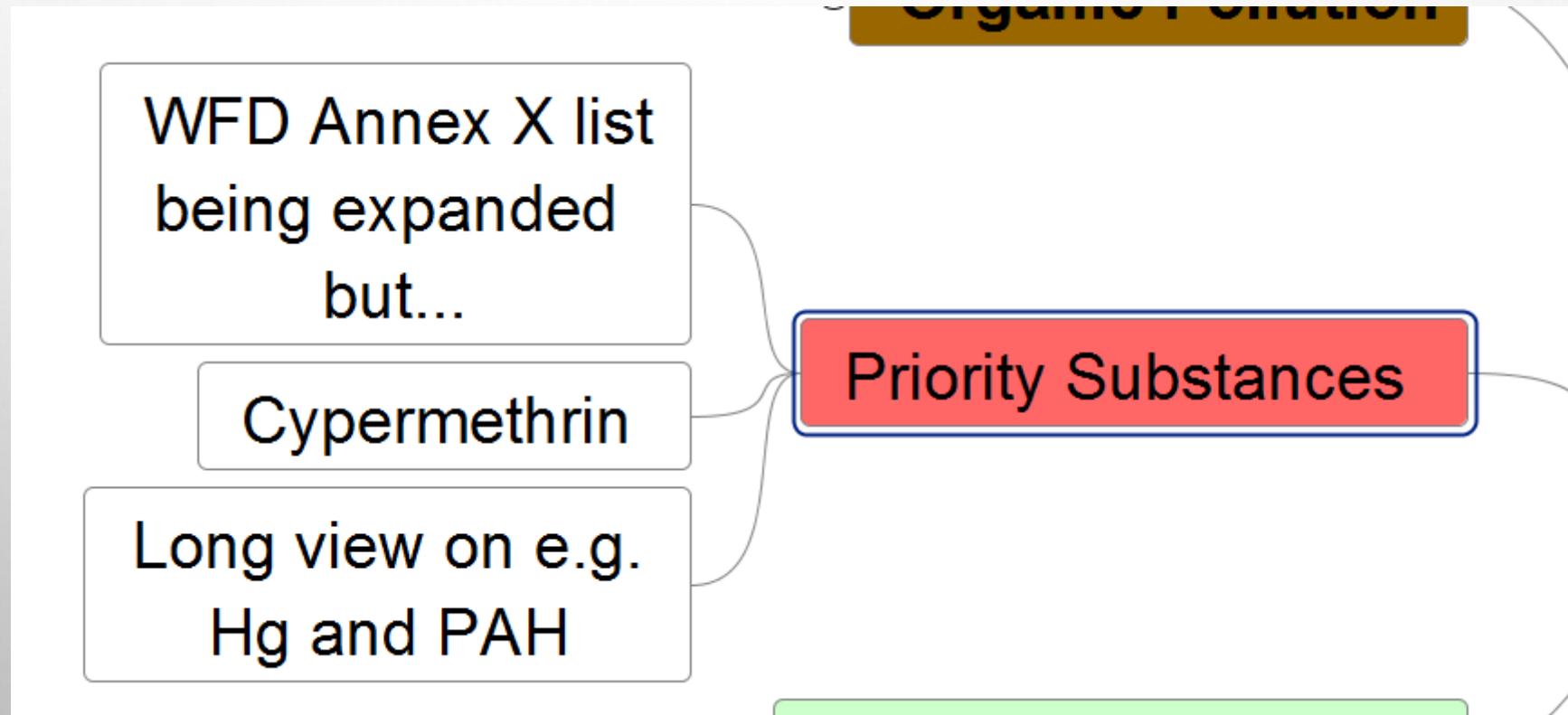
Still with us
but improving

Some good trends

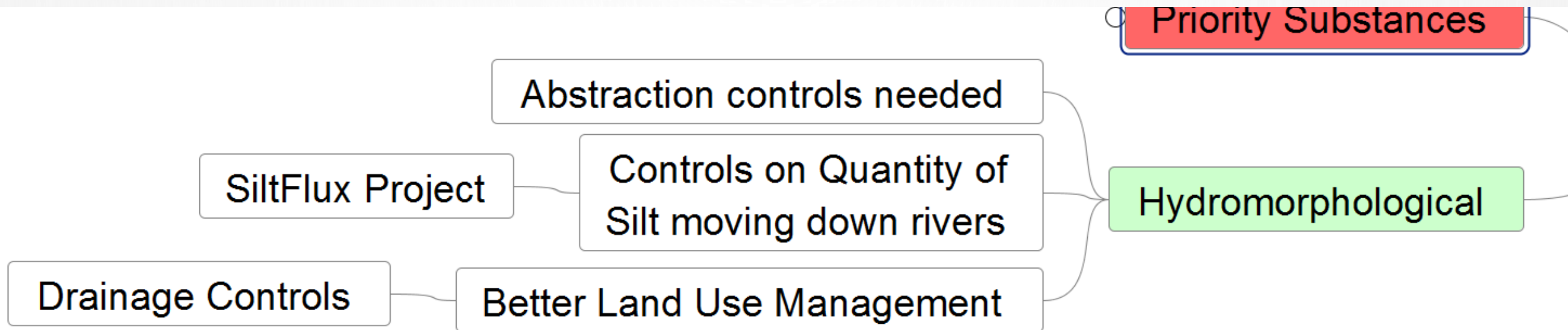
Vigilance Needed
e.g. Harvest 2020



PRESSURES BY TYPE: PRIORITY SUBSTANCES



PRESSURES BY TYPE: HYDROMORPHOLOGICAL



PRESSURES BY TYPE: BIODIVERSITY LOSS

Invasive Species Competition

Fragmentation

○ Fish Species

○ Invertebrates

Loss of Biodiversity →

Fragmentation

○ Arctic Char

Anguilla anguilla

Lampreys

Pollan, Shad, etc.

○ Salmon

Escaped Farm Fish

○ Sea Trout

Fish Species

Loss of Biodiversity →

PRESSURES BY TYPE: BIODIVERSITY LOSS



Fragmentation

- ! Arctic Char
- Anguilla anguilla
- Lampreys
- Pollan, Shad, etc.

Fish Species

Pollution

Climate Change

Migratory Difficulties

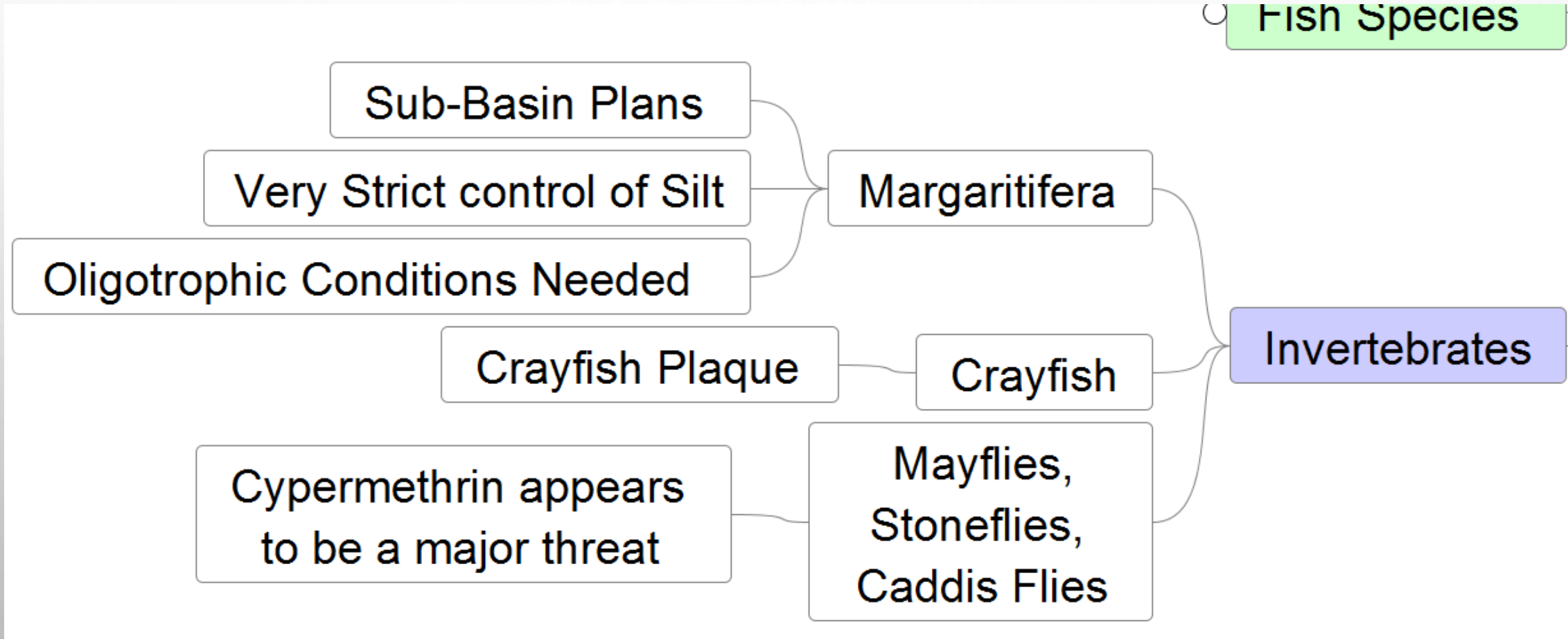
Salmon

Escaped Farm Fish

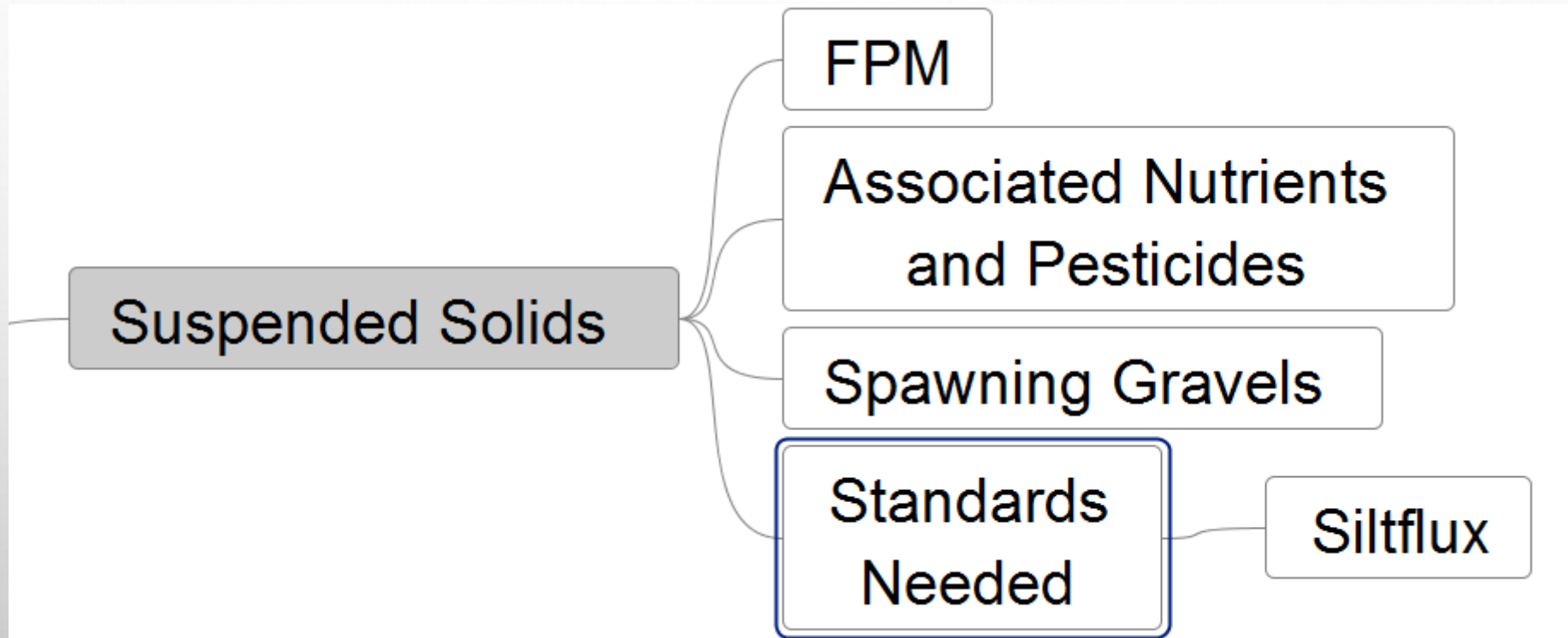
Offshore Fish Farms & Sea Lice

Sea Trout

PRESSURES BY TYPE: BIODIVERSITY LOSS

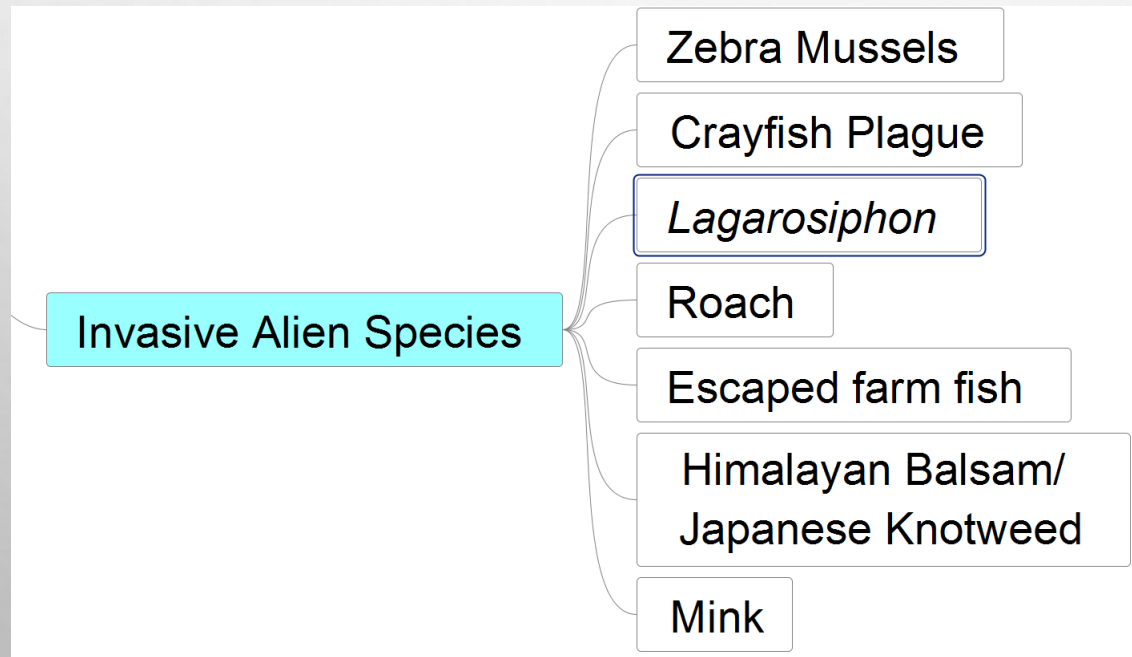
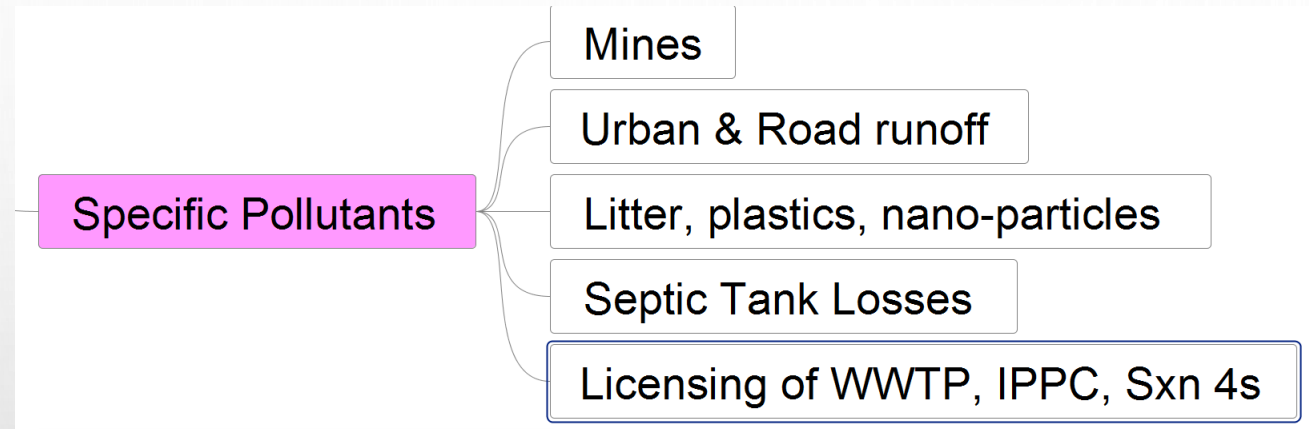


PRESSURES BY TYPE: SUSPENDED SOLIDS

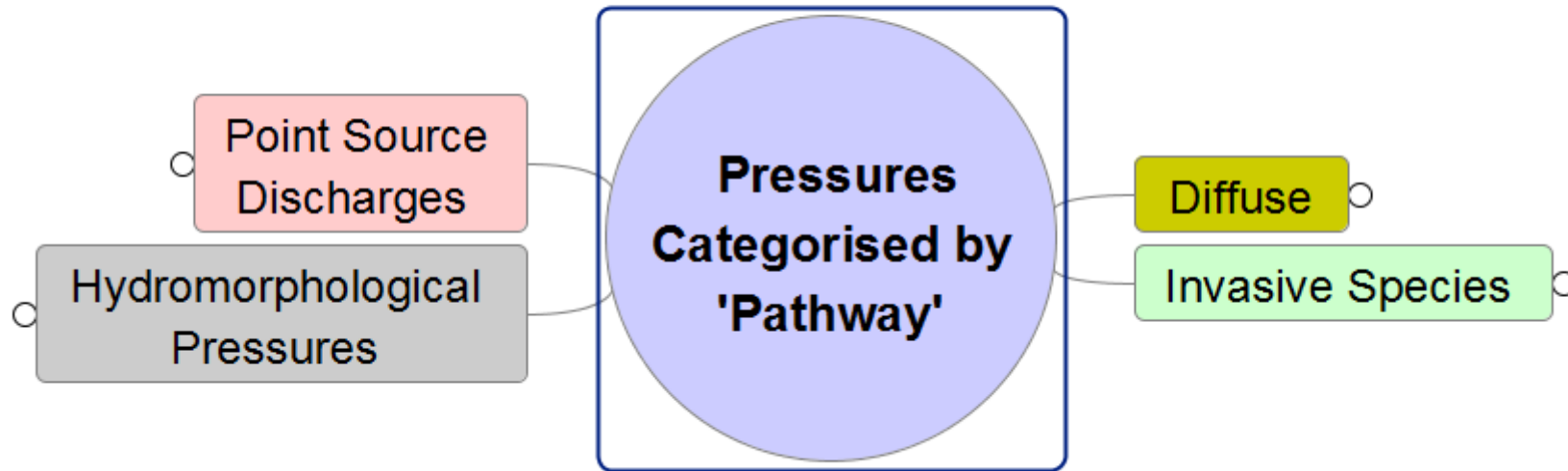


PRESSURES BY TYPE:

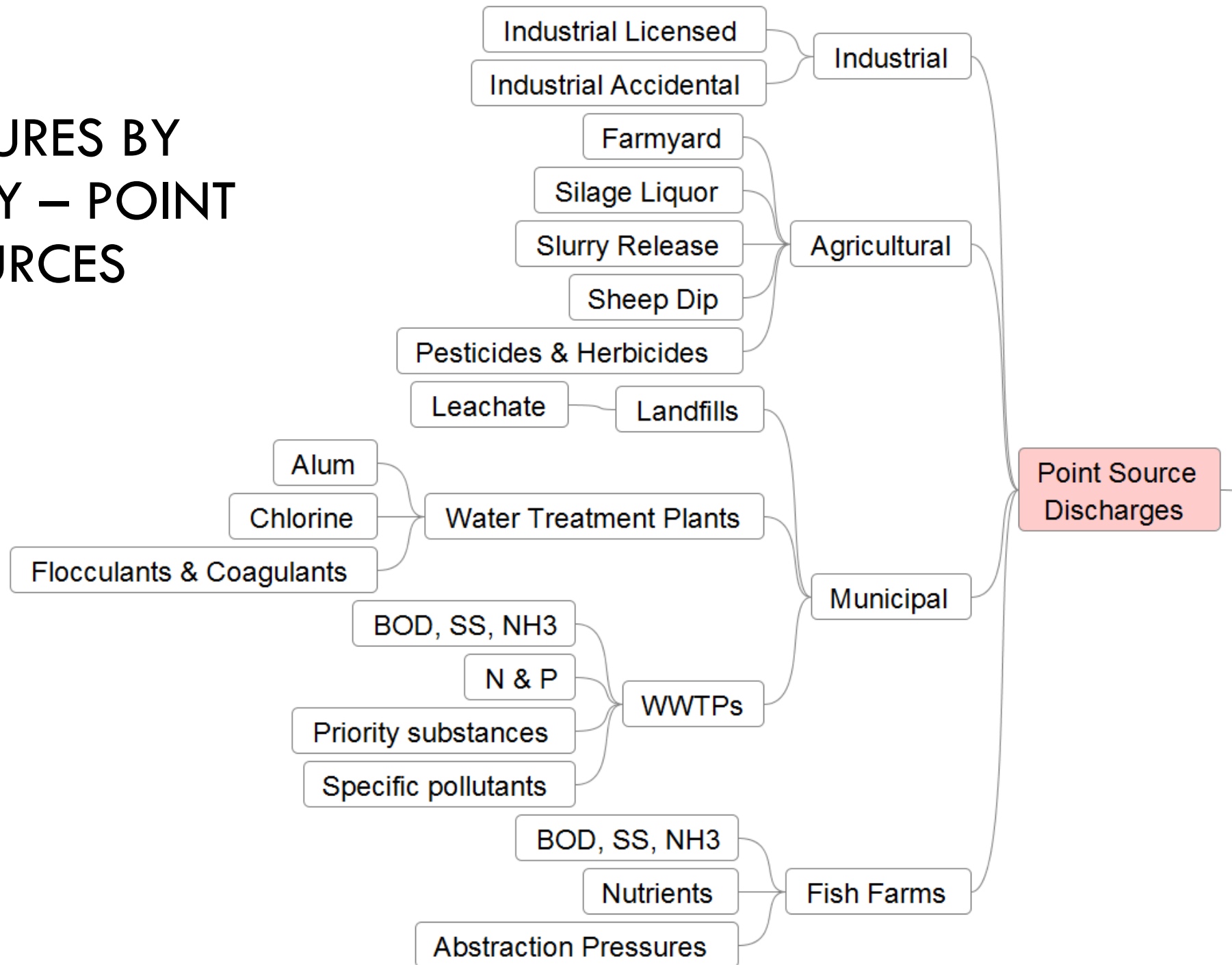
SILTATION, SPECIFIC POLLUTANTS ALIEN SPECIES



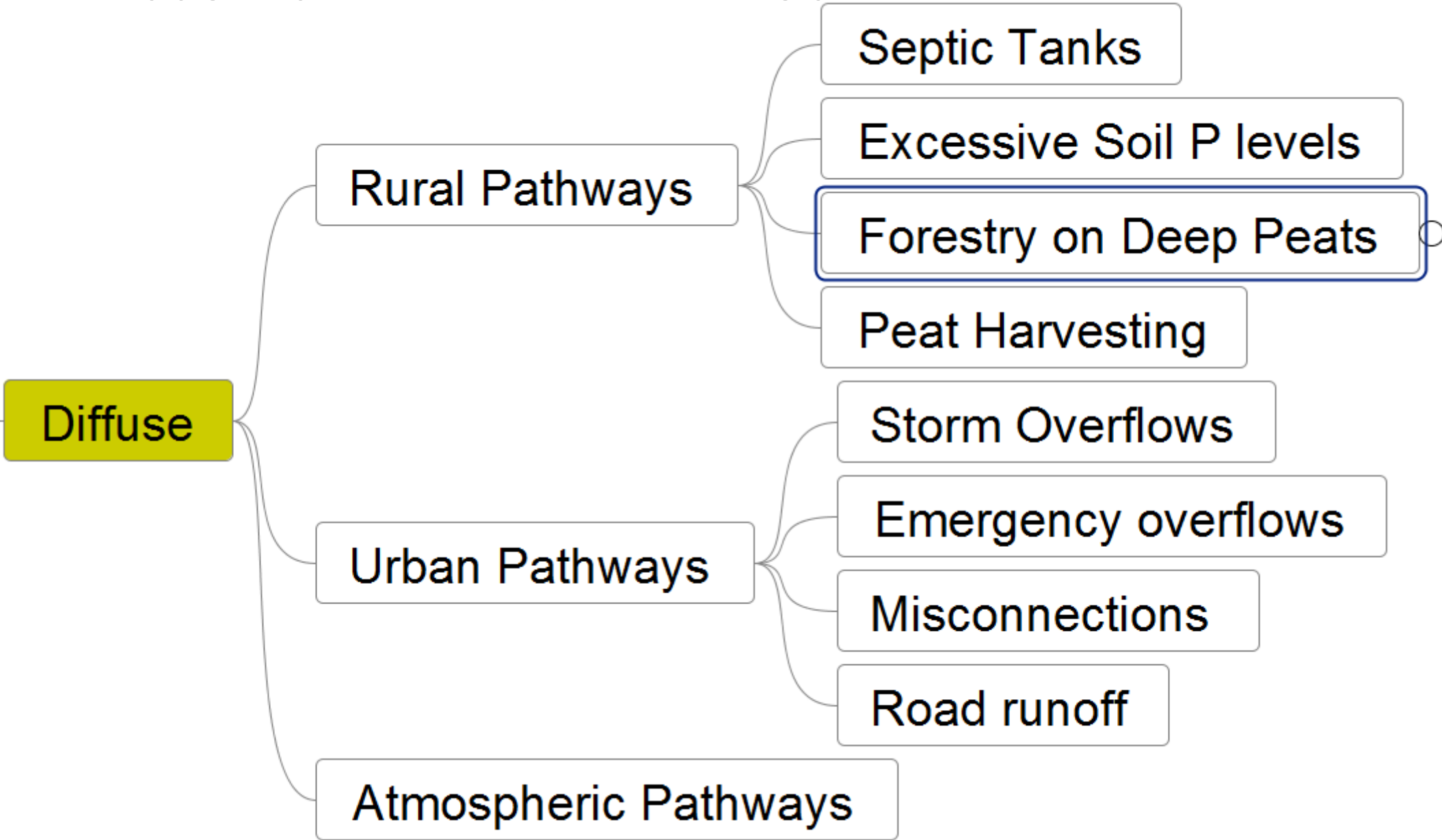
PRESSURES BY PATHWAY



PRESSURES BY PATHWAY – POINT SOURCES



PRESSURES BY PATHWAY: DIFFUSE



PRESSURES BY PATHWAY: INVASIVE SPECIES

Pressure

Invasive Species

Zebra Mussels

Himalayan Balsam destabilising river banks

Crayfish Plague

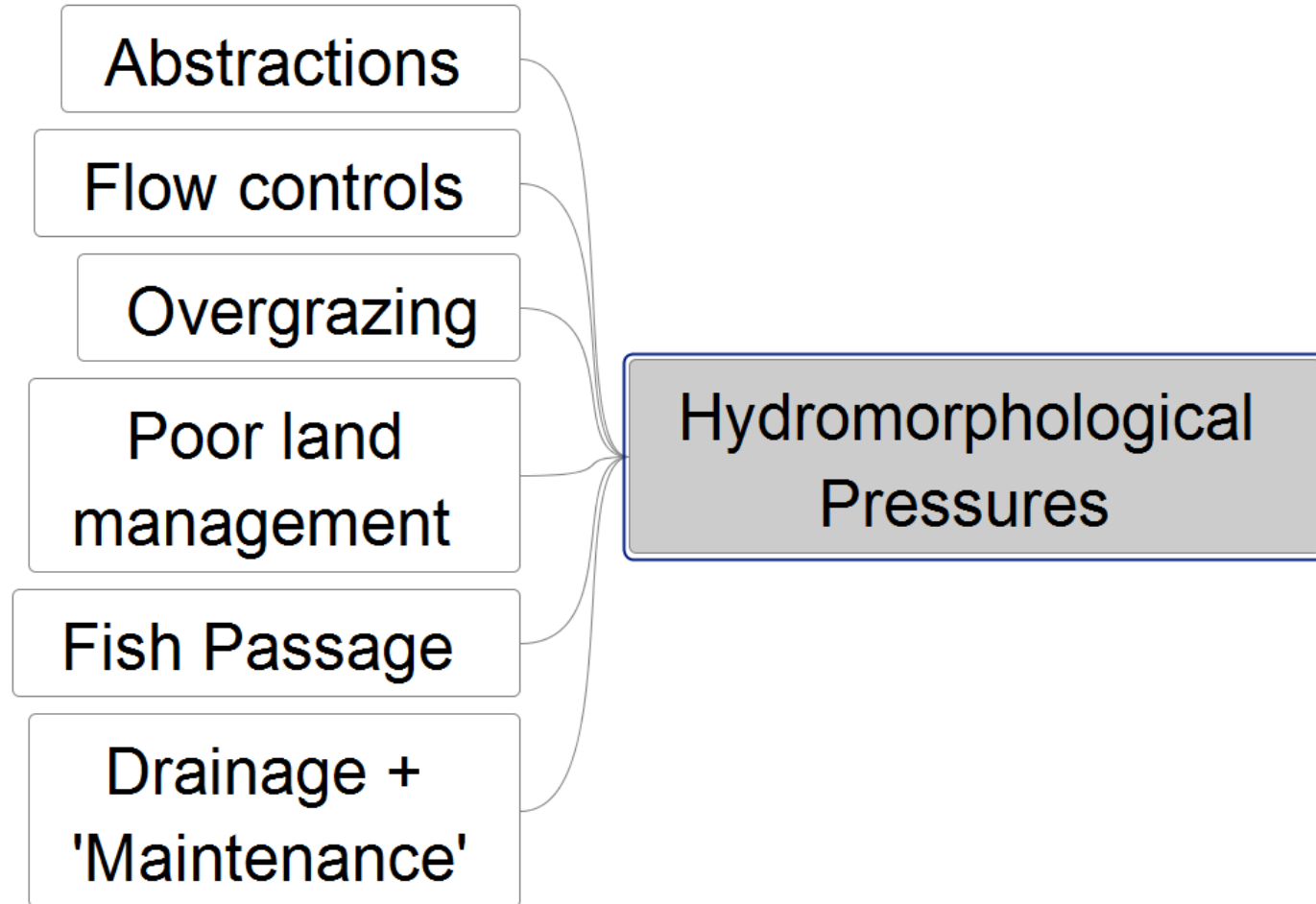
Lagarosiphon

Roach

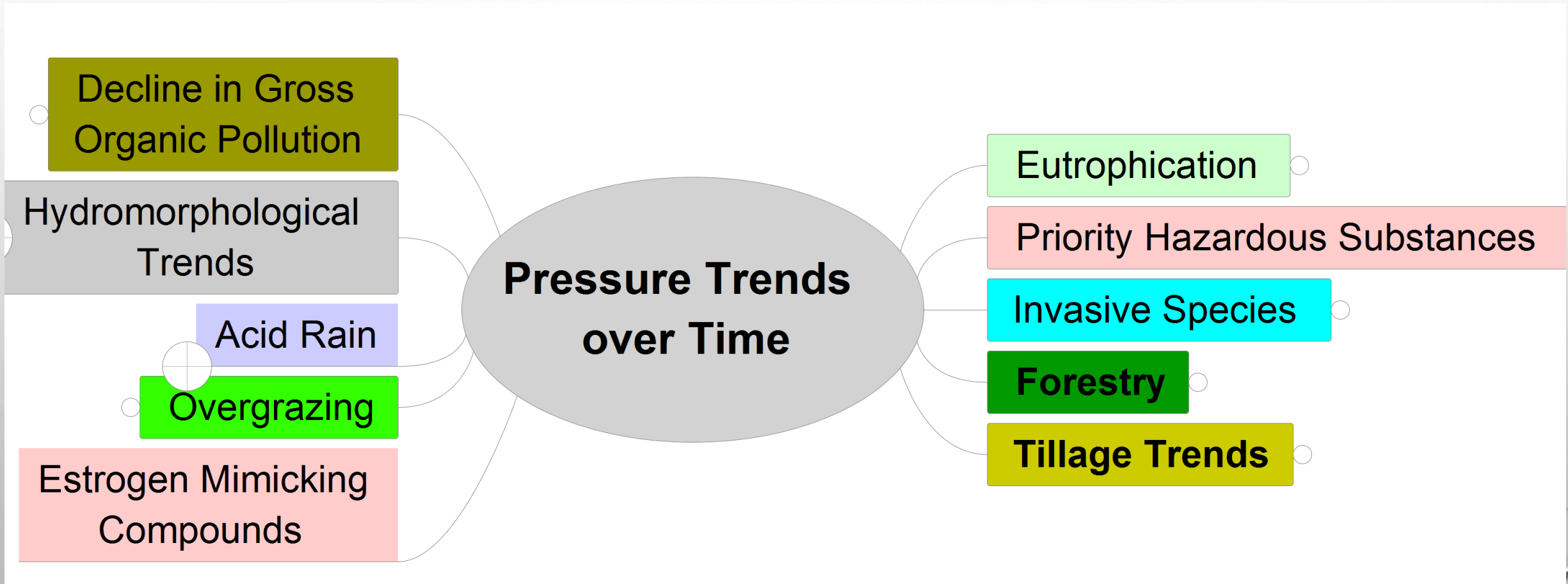
Escaped farm fish

Escaped mink

PRESSURES BY PATHWAY: HYDROMORPHOLOGICAL



PRESSURE TRENDS OVER TIME



PRESSURE TRENDS OVER TIME

THE IRISH TIMES

Friday, June 16, 1989

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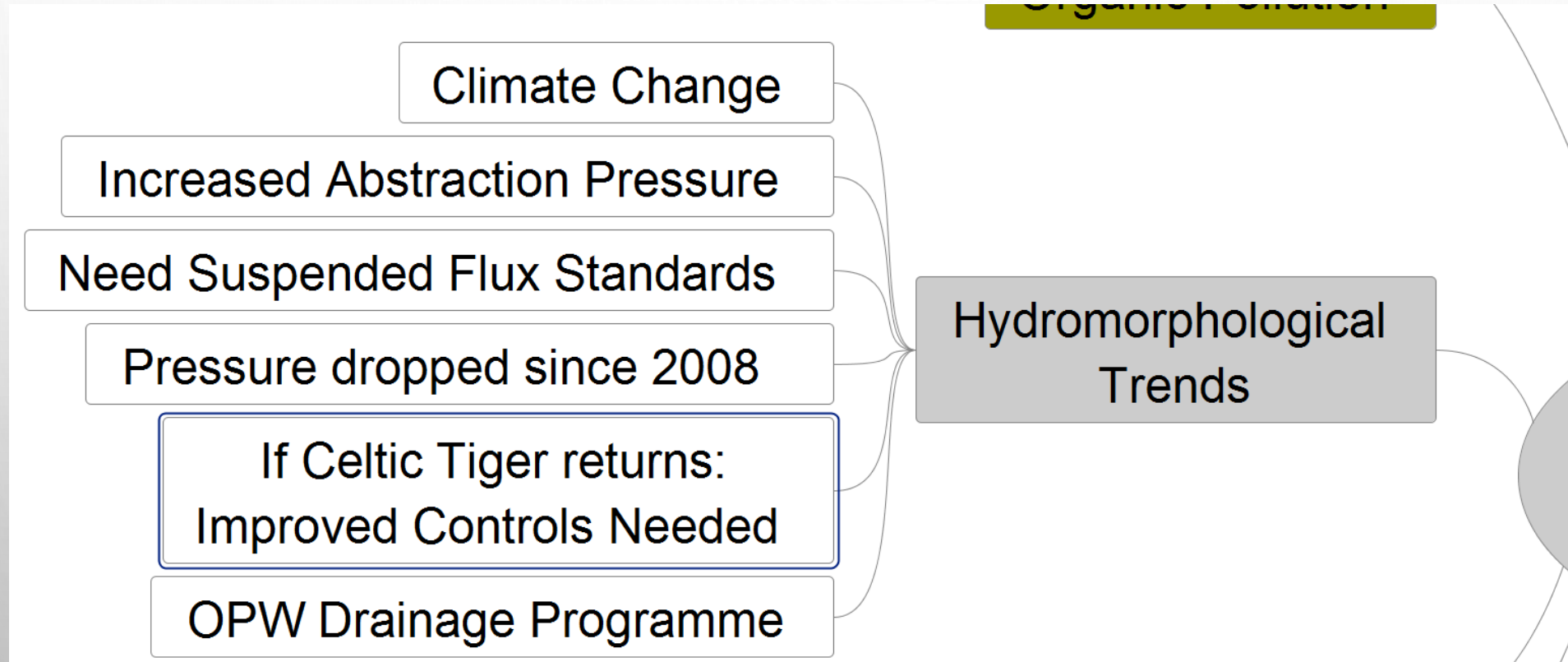
Diminished dramatically since the 1970s

Approx. 10 stretches remaining on Rivers

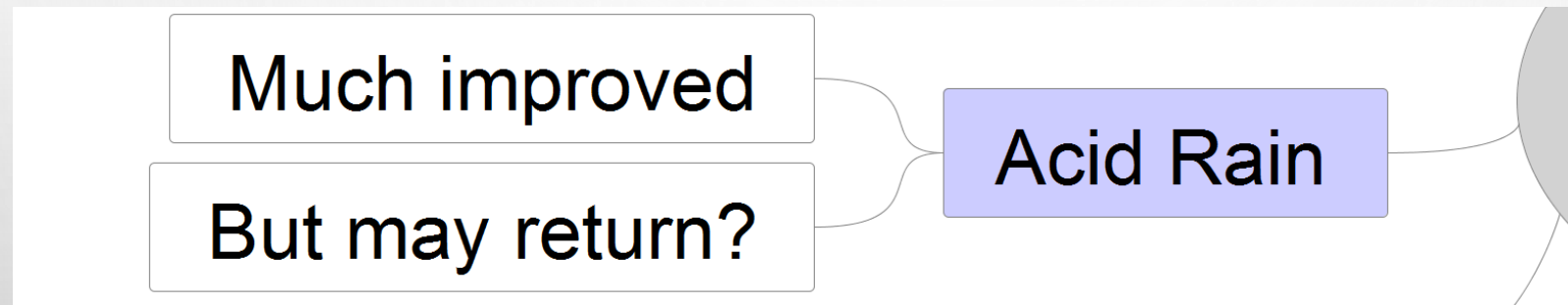
Decline in Gross Organic Pollution



PRESSURE TRENDS OVER TIME



PRESSURE TRENDS OVER TIME



PRESSURE TRENDS OVER TIME

Peaked in late 1980s
and early 1990s

But: Still significant
areas of Overgrazing

Overgrazing

Commonage Framework Plans



PRESSURE TRENDS OVER TIME

A number of recent Research
Projects in Ireland.

Removal in WWTPs?

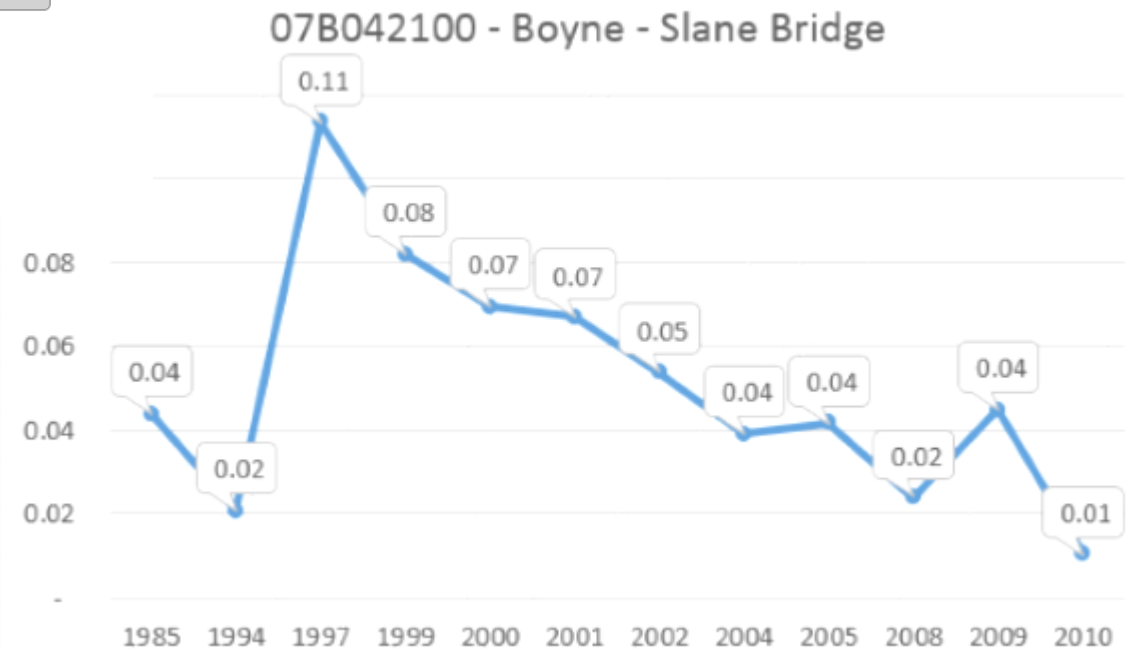
Pharma e.g.
Estrogen Mimicking
Compounds

PRESSURE TRENDS OVER TIME

Eutrophication

Steady drop in Phosphates since 1990s

Will Harvest 2020 reverse this?



PRESSURE TRENDS OVER TIME: PHOSPHATES

Steady drop in
Phosphates since 1990s

e.g. Boyne, Blackwater, etc.

P Regs and SI 272 of 2009

Reduced P recommendations for Grasslands

Agri-Environment Programmes

Research to underpin
fertilisation recommendations and
WFD EQS

P Regs and SI 272 of 2009

PRESSURE TRENDS OVER TIME: PHOSPHATES

on

Will Harvest 2020
reverse this?

Need to Decouple Production
from Impacts per LU

Potential to reverse
downward trends

PRESSURE TRENDS OVER TIME

Priority Hazardous Substances

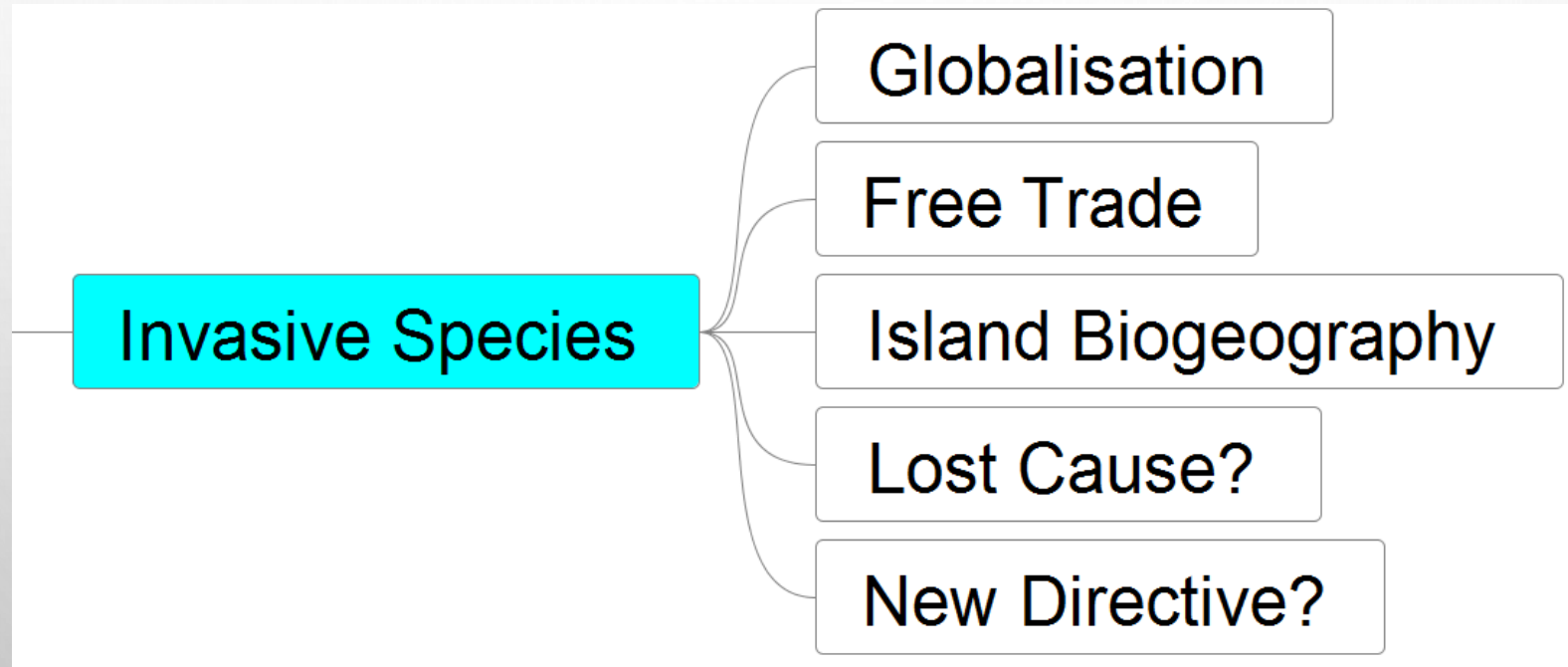
Hg, PAH issues - ubiquitous

Many such as Cadmium declining

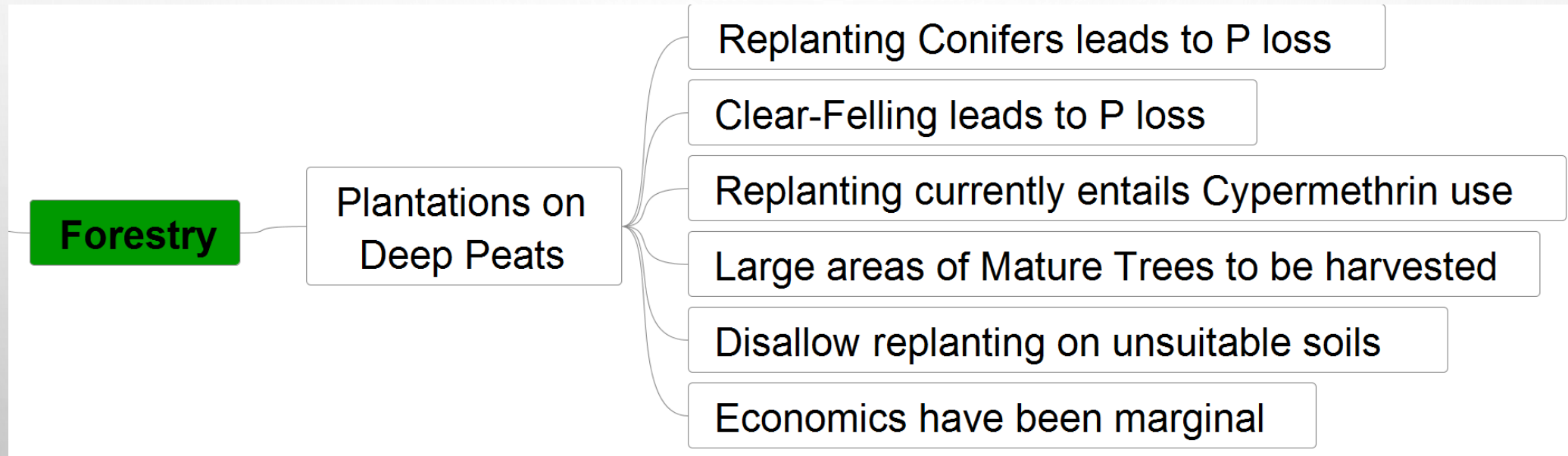
Bans on Atrazine, etc. worked

Cypermethrin wiping rivers in sheep and forestry areas.

PRESSURE TRENDS OVER TIME



PRESSURE TRENDS OVER TIME



PRESSURE TRENDS OVER TIME

Tillage Trends

A more significant pressure on water than Grassland

Siltation

Nutrients

Pesticides and Herbicides

Area relatively small compared with grassland

Regionally important - e.g. in SE

FINALLY

- EXPECTED THE UNEXPECTED
- THE PAST IS A GUIDE BUT THERE'S ALWAYS SOMETHING NEW....





THANK YOU!