

# *Impact of contaminated land on habitats*

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# JUST THREE QUESTIONS...

1. What's the meaning of cont'd land?
2. Which are the pathways from cont'd land to habitats?
3. How can prosecutors demonstrate the impact between cont'd land and habitats?

**...BUT NOT EASY ANSWERS**

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## **1. MEANING OF CONT'D LAND**

- **Withdrawal of Proposal of Soil Directive in 2014 (new WG is working on this)**
- **Soil is considered inside other directives (WatFD, WasFD, ELD, IPPC etc.)**
- **MS don't have a common legislative framework for soil**
- **Land is not just soil but comprehend other matrixes in a broader sense**



# SOIL IS CONSIDERED CONTAMINATED WHEN

- Concentration higher than a threshold
- Risk higher than acceptable

## AND

- Concentration higher than background

When **you may not apply** POLLUTER PAYS PRINCIPLE, you may have other cases like innocent landowners, bona fide prospective purchasers, contiguous property owners, orphan sites.

## 2. PATHWAYS FROM CONT'D LAND TO HABITATS

- Leaching from soil/waste to river/lakes/canals/wetlands
- Fall out and leaching from soil/waste to sea or brackish
- Food chain
- Chemicals from agricultural land
- Mining areas
- Other indirect impacts

## Leaching from soil/waste to river/lakes/canals/wetlands DDT in Lake Maggiore





## DDT from Toce

The data available allowed to estimate an average contribution of about 120 grams of DDT per year to Lake Maggiore.

[Full report \(2010\) here](#)

	Periodo	Portata media m <sup>3</sup> /s	Portata massima m <sup>3</sup> /s	Precipitazione mm	Tipo <sup>a</sup>	DDT <sup>b</sup> ng/g
C1	10-20 gen. 2009	36.15	49.14	4	m	26.16
C2	19-31 ago. 2009	48.69	65.42	34	r	0.44
C3	9-20 ott. 2009	32.22	47.46	0	m	1.20
C4	20-30 ott. 2009	34.77	50.32	33	r	0.23
C5	6-16 nov. 2009	21.24	36.61	13	m	7.82
C6	25 nov.-10 dic. 2009	29.11	105.51	119	r	0.82
C7	10-18 dic. 2009	23.46	36.61	2	m	7.24
P1	30 maggio 2008		615.7	118	p	0.91
P2	5 novembre 2008		787	186	p	7.75
P3	28 aprile 2009		547.5	169	p	0.32
					m	12.03

<sup>a</sup>m = mezzeria, r = riva, p = piena.

<sup>b</sup>Sommatoria DDT isomeri e metaboliti.

The flow of DDT to the lake tends to be greater during flood events, as these carry large amounts of suspended material. However, the greatest contribution to the contribution of DDT to Lake Maggiore is linked to medium-low flows, which transport reduced flows of DDT but for long periods.

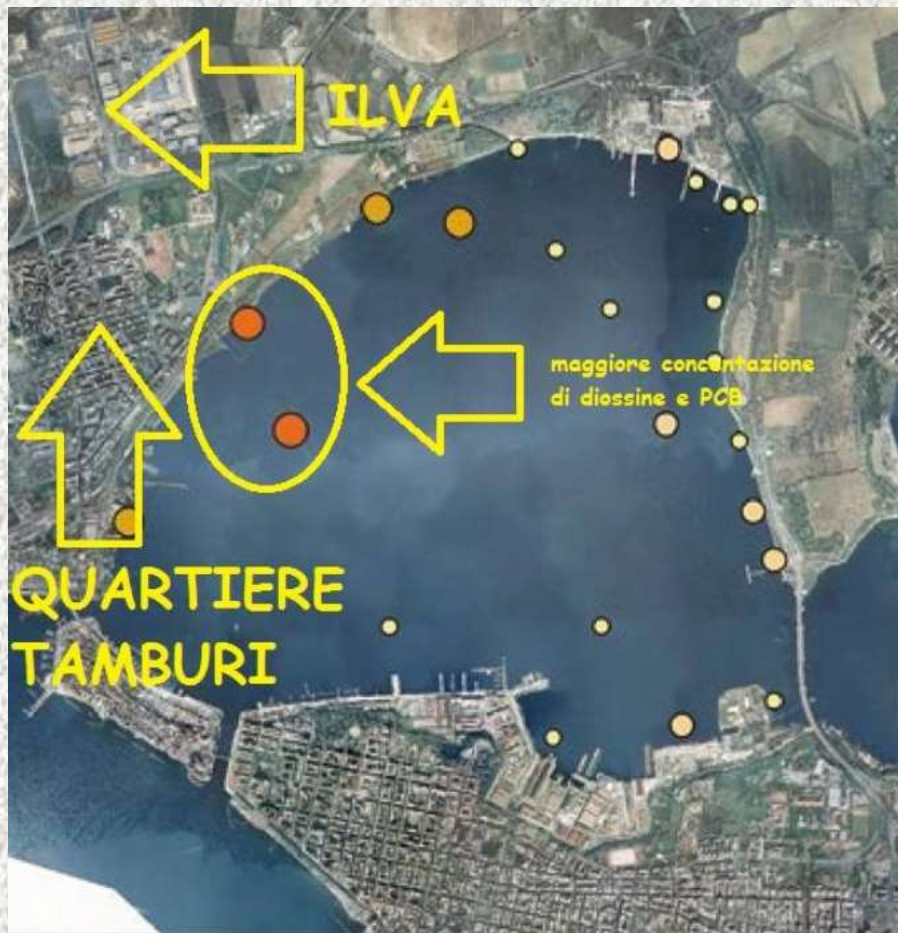




Fall out of dusts and leaking to sea or brackish water  
**Heavy metals and dioxin in Mar Piccolo**



## Fall out of dusts and leaking to sea or brackish water Heavy metals and dioxin in Mar Piccolo



Sommatoria TEQ PCDD/F + DL - PCB  
(pgWHO-TE/L)

- $0 < x \leq 0.0625$
- $0.0625 < x \leq 0.125$
- $0.125 < x \leq 0.25$
- $0.25 < x \leq 0.5$
- $> 0.5$  **massima concentrazione diossine e pcb**





## Mar Piccolo is comprehended in Habitat “Coastal Lagoon” (code 1150) - Annex I of the habitat directive





## Fall out of dusts and leaking to sea or brackish water

### Interventions in Mar Piccolo

- I. Environmental reclamation and redevelopment of the **banks** and neighboring areas
- II. Sustainable removal and disposal of anthropogenic materials on the **seabed**
- III. Remediation of the **bombs** and war residuals
- IV. Interventions for the mitigation of impacts deriving from **discharges**
- V. Interventions for the abatement of sources of contamination from the **surface hydrographic network**
- VI. Intervention for the removal of sources of groundwater **runoff contamination**
- VII. Remediation and / or permanent **sediment** interventions
- VIII. Protection, **monitoring and translocation of species** of conservation interest

(source <http://www.commissariobonificataranto.it/>)



## Food chain in Sacco Valley (Rome province)

# Gamma- HCH (Lindane) in forages and milk

- 34 livestock companies on 244 have **Conc. > 2 mg/kg** of beta-HCH in milk
- 33 on 34 livestock positive to beta-HCH used **forages irrigated or flooded** with river Sacco waters
- Soil and forages have been contaminated through contact with river waters and sediments
- No irrigation and **forbidden any use of land for 100 meters** of buffer from Sacco
- No cultivation on land exposed to floods
- **Shoot down of 6000+** contaminated and substitution with new one
- Money back to farmers





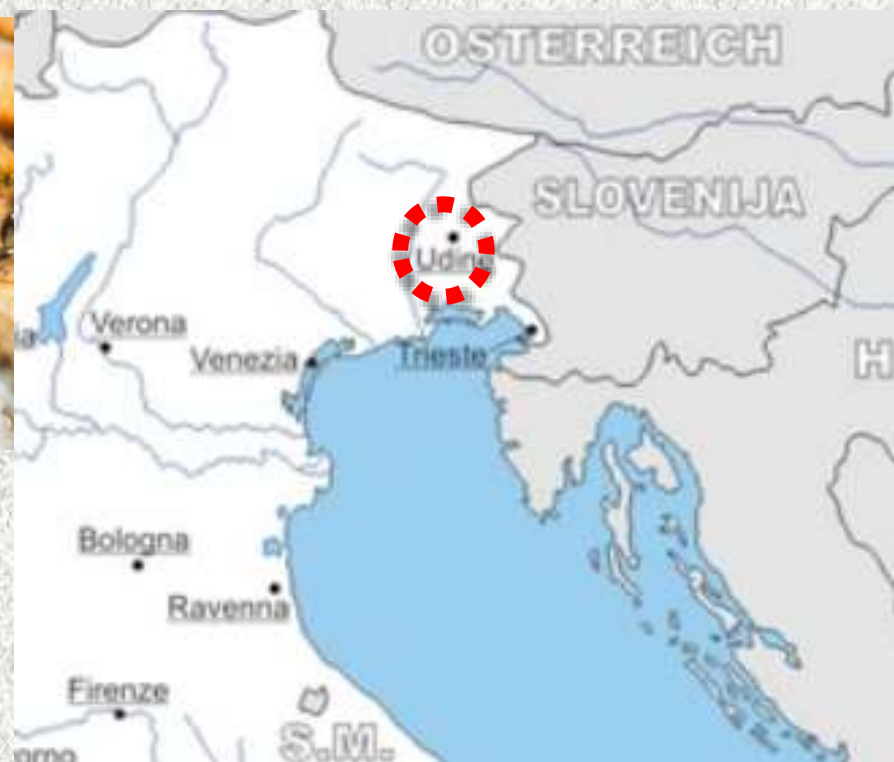
## Food chain in Sacco Valley (Rome province)

# Gamma- HCH (Lindane) in forages and milk

- New monitoring on grass show presence of all isomers of Lindane
- Intervention on primary source (chemical company that bankrupted in 2000), **underground drums with pesticide residuals**
- Very difficult intervention on agricultural area
- No Natura2000 sites but **contamination is in MILK**



## Exposure of chemicals from Agricultural land Bees death in Friuli Region





## Exposure of chemicals from Agricultural land

### Bees death in Friuli Region

- State Forestry Corps during corn weeding, detected bees death from 60k to 10k due to clothianidin, thiamethoxam and imidacloprid (then forbidden in 2013 - EFSA)
  - Effect on nervous systems of dragonflies, locusts, ants, butterflies, fireflies, ladybags, bees and bumblebees
  - 17 agricultural areas were **inhibited to any cultivation** with use of neonicotinoids and harvest elimination
  - Not a N2000 sites but farmers now should go to the court for **ENVIRONMENTAL DISASTER** as impollination is considered as an important ecological function
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## Mining Areas

## Impact on an entire part of Sardinia



*Heaps of extractive waste Masua (Iglesias – Sardinia)*



*Acid Mine Drainage in Rio Piscinas (Iglesias – Sardinia)*

## Mining Areas with N200 sites nearby ITB040071 – From Rio Piscinas to Rio Scivu

Species		Population in the site							Motivation					
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max			IV	V	A	B	C	D
R	1240	<i>Alopecurus fitzingeri</i>						P						
P		<i>Anchusa littorea</i>						V						
P		<i>Armeria punicea</i>						P			X			
A	1201	<i>Bufo viridis</i>						P						
R	1224	<i>Chalcides ocellatus</i>						P						
B	A209	<i>Eritrocus rubecula</i>						P						
P		<i>Genista arborea</i>						P				X		
P		<i>Gennaria dielylla</i>						P						
R	5670	<i>Hieracium viridiflavus</i>						P						
A	1204	<i>Hyla sarda</i>						P						
P		<i>Limonium sulcatum</i>						P				X		
P		<i>Mentha suaveolens ssp. insularis</i>						P				X		
P		<i>Pheum sardinum</i>						R						
R	1250	<i>Podarcis sicula</i>						P						
R	1246	<i>Podarcis tiliguerta</i>						P						
P		<i>Romulea romulei</i>						P				X		
P		<i>Scroptularia ramosissima</i>						P						X
P		<i>Silene succulenta ssp. corsica</i>						P				X		
P		<i>Stachys glutinosa</i>						P				X		
B	A305	<i>Sylvia melanocephala</i>						P						
B	A283	<i>Turdus merula</i>						P						
B	A285	<i>Turdus philomelos</i>						P						
B	A232	<i>Upupa epops</i>						P						



## Other indirect impacts

- **Flooding risk**
- **Climate change**
- **Emissions of chemicals**
- **Industrial sewage not managed**
- **Many others...**

### **3. HOW CAN PROSECUTORS DEMONSTRATE THE IMPACT OF CONT'D LAND ON HABITATS?**

- A. Dimension criterion**
- B. Significance criterion**
- C. Measurable values criterion**
- D. Habitat status variation**
- E. Protected species status**



### A. Dimension criterion

For having an impact we should focus on “Large portions of soil” ...



1. **Part** of the site area is deteriorated
2. **Whole site area** is deteriorated or compromised
3. Impairment/deterioration **goes outside the site**
4. Impairment/deterioration goes **beyond the state boundary** or territorial waters

## B. Significance criterion

Significance should be in relation  
to the environment



1. Intended use of the area can not be respected
2. Soil or the subsoil can not perform its **ecosystem services**



# Ecosystem services

1. life support (such as **nutrient cycle**, soil formation and primary production)
2. supply (such as **food production**, drinking water)
3. regulation (such as climate and tide regulation, water purification, **pollination** and infestation control)
4. cultural values (including **aesthetic**, spiritual, educational and recreational ones).

### C. Measurable values criterion

1. Frequency and amplitude of the exceeding of the threshold values/acceptable risk
2. Frequency and severity of violations of what is/was reported in the authorization of the site owner
3. Gravity and persistence over time of the effects produced by contamination on environmental matrixes or on flora and fauna, also due to the extension or the qualitative characteristics (biodisponibility) of the pollutants
4. Time needed for reclamation to baseline or to acceptable risk
5. Degree of technical difficulty of the damage restoration



### **C3. Persistence over time (OECD tests)**

1. No. 301: [Ready Biodegradability](#)
2. Series 302: Inherent Biodegradability: [Modified SCAS Test](#), [Zahn-Wellens/EVPA Test](#), [Modified MITI Test \(II\)](#)
3. No. 304A: [Inherent Biodegradability in Soil](#)
4. No. 307: [Aerobic and Anaerobic Transformation in Soil](#)
5. No. 308: [Aerobic and Anaerobic Transformation in Aquatic Sediment Systems](#)
6. No. 309: [Aerobic Mineralisation in Surface Water – Simulation Biodegradation Test](#)
7. No. 315: [Bioaccumulation in Sediment-dwelling Benthic Oligochaetes](#)
8. No. 317: [Bioaccumulation in Terrestrial Oligochaetes](#)

## D. Habitat conservation status

The achievement or maintenance of a favorable conservation status of habitats is to be evaluated in reference:

1. **state of conservation** before the event/damage,
2. **services offered** by the habitat
3. capacity for **natural regeneration**

### **NOT ALL** HABITAT VARIATIONS ARE CRIMES!!

1. negative changes lower than natural fluctuations are considered normal
2. negative changes due to natural causes
3. damages to species or habitats for which it is established that they will be restored within a short time and without intervention, either in the original or better than the baseline conditions
4. damages resulting from authorized interventions related to the management of the sites...



## **E. Protected species status**

1. number of individuals, their density or area covered;
2. the role of certain individuals or the damaged area in relation to species or habitat conservation
3. the rarity of the species (assessed at local, regional and higher levels);
4. capacity of propagation of the species (according to the dynamics typical of the species or population);
5. species vitality or capacity for natural habitat regeneration (according to the dynamics typical of the species that characterize it or their populations);
6. capacity of the species, after the damage has occurred, to restore itself in a short time, without interventions other than reinforced protection measures

*Thank you for your kind attention*

*Σας ευχαριστώ για την ευγενική σας  
προσοχή*

*Grazie per la vostra attenzione*

*謝謝你的關注*

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