

Mammals, Birds and Fish Plagued Worldwide by Harmful Chemicals : Wildlife Polluted by “Flame Retardants” on Massive Scale

By [Green Science Policy Institute](#)

Theme: [Environment](#)

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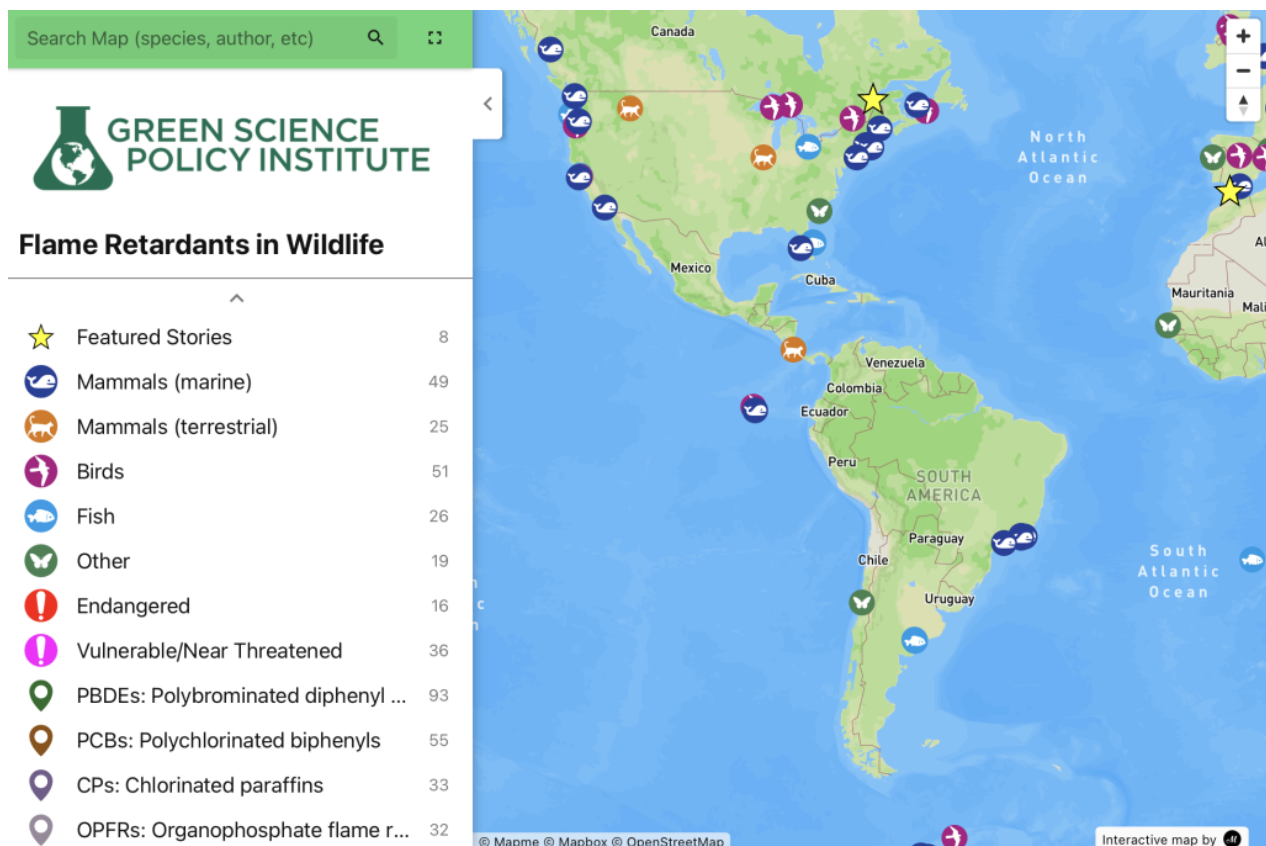
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Belugas to Butterflies Plagued by Harmful Chemicals



[Click here for the interactive map](#)

Important notes:

- Only a subset of animals in a few regions have been studied for specific flame retardants.
- This map shows a selection of peer-reviewed studies; many more exist.
- Flame retardants are used to meet flammability standards which often do not provide [meaningful fire-safety benefits](#) and can be [influenced](#) by flame retardant manufacturers.
- Wildlife & humans are exposed to flame retardants from air, water, & food; see observed health harms below.
- This exposure can continue decades after a specific flame retardant is phased out due to its persistent, mobile, bioaccumulative, & toxic properties.
- Flame retardants should be used only after their lack of health harm and value in preventing fires have been demonstrated.

A Selection of Health Effects of Flame Retardants in Wildlife

Flame Retardant	Animal	Health Impact
Polychlorinated biphenyls (PCBs)	Killer Whales	Estimated to threaten long-term viability of >50% global killer whale population
	River Otters	Associated with changes in thyroid & sex hormone levels
	Polar Bears	Associated with changes in thyroid hormone levels
	Beluga Whales	Altered vitamin A and E profiles
	Ringed Seals	Impacted health-related gene transcription
	Killer Whales	Altered gene transcription
PBDEs	American Kestrels	Lowered reproductive success, less copulation & pair bonding
	Sea Lions	Associated with urogenital cancer
	Chinook Salmon	Increased infectious disease susceptibility
	Mice	Decreased thyroid hormone concentrations
	Polar Bears	Associated with changes in thyroid hormone levels
Chlorinated paraffins	Rainbow Trout	Diminished startle response, loss of equilibrium, liver lesions (SCCPs, MCPPs)
	Zebrafish	Altered thyroid hormone levels (SCCPs)
	American Kestrels	Reduced thyroid hormones (SCCPs)
Other halogenated FRs	American Kestrels	Likely obesogenic (DBE-DBCH)
		Reduced vocalization, courtship, egg mass, & male parental behavior (HBCD)
		Thyroid disruption, oxidative stress, altered heart & brain mass (EHTBB, TBPH)
Organophosphate FRs	Rats and Mice	Increased liver and kidney tumors (TCPP)
	Japanese Quail	Thyroidal effects, suppressed growth, reduced metabolic rate (TPhP)
	Zebrafish	Altered motility & anxiety-related behavior (IPP, BPDP, EHDP)
	Mice	Oxidative stress & endocrine disruption, e.g. decreased testosterone (TCEP, TPP)
	Zebrafish	Altered hormone levels, decreased egg production, & malformation (TDCPP)

The above health impacts are just the tip of the iceberg when it comes to health harms

experienced by wildlife due to the use of flame retardant chemicals in products before safety and efficacy are demonstrated.

Flame retardants also cause health harm in humans, including:

- Endocrine disruption
- Neurodevelopmental effects
- Decreased fertility
- Some cancers

Learn more about flame retardants at SixClasses.org and reducing exposure [here](#).

Abbreviation	Chemical Name	Abbreviation	Chemical Name
SCCP	short chain chlorinated paraffins	PBT	pentabromotoluene
MCCP	medium chain chlorinated paraffins	RDP	resorcinol bis(diphenyl phosphate)
LCCP	long chain chlorinated paraffins	TBBPA	tetrabromobisphenol A
pentaBDE	pentabromodiphenyl ether	TBBPA-DBPE	tetrabromobisphenol A bis(2,3-dibromopropyl ether)
octaBDE	octabromodiphenyl ether	TBBZ	tribromobenzene
decaBDE	decabromodiphenyl ether	TBECH/DBE-DBCH	1,2-dibromo-4-(1,2-dibromoethyl)cyclohexane
PCBs	polychlorinated biphenyls	TBOEP/TBEP	tris(2-butoxyethyl) phosphate
BDP	bisphenol-A bis(diphenyl phosphate)	TBX	2,3,5,6-tetrabromo-p-xylene
BaPhP	butyl diphenyl phosphate	TCEP	tris(2-chloroethyl) phosphate
BEHTBP/BEH-TEBP/TBPH	bis(2-ethylhexyl)-tetrabromophthalate	TCP	tricresyl phosphate
BPDP	tert-butylphenyl diphenyl phosphate	TCIPP/TCPP	tris(1-chloro-2-propyl) phosphate
BTBPE	1,2-bis(2,4,6-tribromophenoxy)ethane	TDCIPP/TDCPP	tris(1,3-dichloro-2-propyl) phosphate
DBDPE	decabromodiphenylethane	TEHP	tris(2-ethylhexyl) phosphate
dBPhP	dibutyl phenyl phosphate	TEP	triethyl phosphate
DCP	diphenyl cresyl phosphate	THP	trihexyl phosphate
DPTE/TBP-DBPE	2,3-dibromopropyl-2,4,6-tribromophenyl ether	TIBP	triisobutyl phosphate
EHDP/EHDPP/EHDPPH	2-ethylhexyl diphenyl phosphate	TIPPP	tris(4-isopropylphenyl) phosphate
EHTBB	2-ethylhexyl-2,3,4,5-tetrabromobenzoate	TMCP	tri-m-cresyl phosphate
HBB	hexabromobiphenyl	TMP	trimethyl phosphate
HBBz	hexabromobenzene	TMPP	trimethyl phenyl phosphate
HBCD/HBCDD	hexabromocyclododecane	TNBP/TnBP	tributyl phosphate
HCDBCO	hexachlorocyclopentadienyl-dibromocyclooctane	TPhP/TPP	triphenyl phosphate
IDPP/IDDPHP	isodecyl diphenyl phosphate	TPPO	triphenylphosphine oxide
IPP	isopropylated phenyl phosphate	TPTP	tri-p-cresyl phosphate
IPPP	isopropylated triphenyl phosphate	TTBPP	tris(4-tert-butylphenyl) phosphate
PBBz	1,2,3,4,5-pentabromobenzene	TXP	trixyl phosphate
PBEB	pentabromoethylbenzene		

If you'd like to suggest a new study that could be added to our selection of points, email it to Lydia@GreenSciencePolicy.org.

Map designed and produced by Maddie Dolan.

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