



**RINSE**

Reducing the impact of  
non-native species in Europe

# The control and eradication of invasive non-native species

A comprehensive guide on the control and eradication of three invasive non-native plants commonly found on farmland



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Photo Credit: GBNSS

**Japanese knotweed**



Photo Credit: GBNSS

**Himalayan balsam**



Photo Credit: RPS group Plc

**Giant hogweed**



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# Japanese knotweed

*Fallopia japonica*

## Species Profile:

**Origin:** Asia

**UK Distribution:** Widespread

**Habitat:** Damp environments, along watercourses

**Pathway:** Introduced as ornamental plant in 19<sup>th</sup> century

**Reproduction:** Solely vegetative, sprouting from fragments of rhizome and stem

## Legislation:



**Wildlife and Countryside Act 1981**  
**Schedule 9**



**Environmental Protection Act 1990**  
**Classified Waste**

## Japanese knotweed and the environment

**Japanese knotweed** can **rapidly displace native vegetation**, forming **large dense thickets** which are **problematic** and **costly to eradicate**.

**Eradication** of this species is **required by law** when **developing a site** due to the **destructive nature** of its thick extensive **rhizome** system.

There is no obligation for you to eradicate this species from your land, or to report its presence to anyone. However, if this species spreads from your land to the wild or a neighbour's property you could be liable.



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# Japanese knotweed

*Fallopia japonica*

Shield-shaped leaves  
with a flat base

Zig-zag stem

Large thick roots

Photo Credit: Snowdonia  
National Park Authority

Purple-speckled  
bamboo-like stems

Photo Credit: ivm

Photo Credit: GBNNS



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# Japanese knotweed

*Fallopia japonica*

You have no obligation to report the presence of Japanese knotweed on your land.

**HOWEVER, we recommend that you report the presence of Japanese knotweed to allow us to effectively monitor its distribution and plan larger scale eradication programmes.**

It is crucial that we have good data on the distribution of invasive species to understand the extent of the problem across Europe and plan our responses to these threats.

Records of invasive species on farmland are under-represented, yet the farmed landscape is an integral part of the European environment.

You can be our eyes and ears in the vast farming landscape improving our records and helping us to better tackle the threats from invasive species such as Japanese knotweed.

## REPORT IT!



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# CONTROL AND ERADICATION

Japanese knotweed can be problematic and complex to eradicate. If you need to remove the species urgently it is recommended you seek [expert help](#)

**Licensed professionals can eradicate Japanese knotweed quickly and efficiently. A common professional method in the control of Japanese knotweed is stem injection.**



Photo Credit: NNNSI

A small concentrated dose of herbicide is injected into each stem of the infestation. The plant then transports this herbicide around to its root, killing the rhizome and plant.

If there are no time restrictions, Japanese knotweed can be eradicated slowly but at a low cost over several years.

Here is a guide to the recommended methods for its eradication



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# CHEMICAL



Japanese knotweed is sensitive to a range of herbicides, including Roundup.

**Follow instructions** relevant to the herbicide you choose.

**Repeat sprayings** should be made when new growth starts to appear throughout the year. This will require **regular monitoring**

Continue this process for **three years**

**Combining herbicide** treatment with **regular cutting** is the **most effective** method **against Japanese knotweed.**

Herbicide	Selectivity	When to apply	Use near water	Persistence
Glyphosate	Non-selective – damages grasses	May to October – late season	<b>APPROVED</b> – refer to guidelines	Non-persistent
2, 4-D Amine	Selective	May to October – early season	<b>APPROVED</b> – refer to guidelines	1 month
Triclopyr	Selective	May to October – early season	NO	6 weeks
Picloram	Selective	All year	NO	2 years

**NOTE: IF YOU ARE TREATING JAPANESE KNOTWEED NEAR WATER YOU WILL NEED TO INFORM THE EA OF HERBICIDE USE.**

[SEE HERE](#)

The rhizomes of this plant can remain viable for up to 20 years underground and therefore the area of soil will likely remain contaminated with Japanese knotweed.



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# PHYSICAL

NOTE: DUE TO ITS VEGETATIVE REPRODUCTION STRATEGY, A CUTTING METHOD WHICH PRODUCES MINIMUM FRAGMENTATION IS RECOMMENDED.

TAKE CARE TO ENSURE EQUIPMENT IS CLEANED THOROUGHLY BEFORE USING AT ANOTHER SITE

**Cutting** the plant will **reduce root growth** and **increase leaf production**. **Digging** the infested soil will bring the **root system** to the **surface** and stimulate the plant to grow a **high density** of **canes**. Both of these leave the plant more **vulnerable** to **herbicide** treatment.

The plant should be **cut cleanly** at the **base of the stem**.

The **cut canes** should be **left to dry out on-site** on a **hard surface**.

Once the **stems** turn **deep brown** they are **dead**.

**Cultivate** the exposed infested ground to **50 cm deep**, **turn** the piled material and then **re-spread** over **exposed area**.



This **cutting** and **digging** combination should take place **four times a year**:

**1<sup>st</sup> cut and dig** – when the **first shoots** appear

**2<sup>nd</sup> & 3<sup>rd</sup> cut and dig** – **equally spaced** out between **1<sup>st</sup> and 4<sup>th</sup>**

**4<sup>th</sup> cut and dig** – **before the plant dies back** in the **autumn**

This method will be **required annually** for **three years**.



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# DISPOSAL

## CONTAMINATED SOIL

The area of **soil around the infestation** will be **contaminated** with Japanese knotweed **rhizomes**.

To avoid spreading Japanese knotweed you **SHOULD NOT move** this **soil** or use it **anywhere else** on your land.

## PLANT WASTE

Plant waste material should be left to **thoroughly dry out** on a **solid surface**.

You can **burn** the **plant waste under controlled conditions**. **Business burnings** will need to **inform EA**.

**WHERE POSSIBLE YOU SHOULD AVOID MOVING JAPANESE KNOTWEED WASTE FROM THE INFESTED SITE.**

**Burnt plant waste** and **contaminated soil** can be **buried on-site**.

The material needs to be buried **5 metres down** and **covered with a root membrane**.

This hole should then be **filled** in with **topsoil** or an **inert filler**.

However, if necessary contact your local authority to find the **nearest waste place which will accept Japanese knotweed** waste. **Bag it** and transport it there carefully.



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# INVASION PREVENTION

Once you have successfully eradicated the invasive plant from your land, the area will be exposed and vulnerable to soil erosion and further invasion.

To reduce the likelihood of further invasion it is **recommended** that you **bring the area into regular use**.

**Establishing a strong grassland community will protect your land.**

**Grass mixtures** should be sown at **high densities**.

Mixtures should be **competitive**, create **dense swards** and have good **growth following cutting**.

Some recommended mixtures include:

*Dactylis glomerata*, *Festuca rubra* (50:50)

*Lolium perenne*, *Festuca rubra*, *Poa pratensis*  
(12:35:53)



Photo Credit: othree



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Alternatively, you could bring the land into **crop rotation**.



Photo Credit: Kate Jewell



Photo Credit: Richard Webb

If the infested area was a **natural area**, building a **strong plant community** is recommended.

Some invasive plants, such as giant hogweed, are intolerant of shade. **Establishing wooded areas** would prevent invasion from such species.



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# Himalayan balsam

*Impatiens glandulifera*



## Species Profile:

**Origin:** West and central Himalayas

**UK Distribution:** Widespread

**Habitat:** Damp environments, along slow-moving watercourses

**Pathway:** Ornamental plant

**Reproduction:** Spreads by seed, producing numerous explosive seed pods which collectively can hold over 800 seeds.

## Legislation:



**Wildlife and Countryside Act 1981**

**Schedule 9**

### Himalayan balsam and the environment

As with most invasive plants, Himalayan balsam can quickly dominate large areas, excluding the native vegetation. It is a particular problem along watercourses.

Himalayan balsam has become popular with bee keepers as the purple/pink flowers and nectar are highly desirable to bees. Unfortunately, this bias in pollination will reduce the diversity of the surrounding flora reducing the habitat quality for other seed-eating species.

**There is no obligation for you to eradicate this species from your land, or to report its presence to anyone. However if this species spreads from your land to the wild or a neighbour's property you could be liable.**



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# Himalayan balsam

*Impatiens glandulifera*



Bright purple-pink flowers

Trumpet-shaped



Photo Credit: GBNNS

Hollow brittle stem



Photo Credit: RPS group Plc

Lush green colour



Photo Credit: GBNNS

Leaves up to 15cm long

Finely serrated edges



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# Himalayan balsam

*Impatiens glandulifera*



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**HOWEVER, we recommend that you report the presence of Himalayan balsam to allow us to effectively monitor its distribution and plan larger scale eradication programmes**

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You can be our eyes and ears in the vast farming landscape improving our records and helping us to better tackle the threats from invasive species such as Himalayan balsam.

## REPORT IT



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# CONTROL AND ERADICATION

Controlling and removing Himalayan balsam can be cheap and easy, however the timing of treatment is crucial – you **MUST** treat the plants before they set seed.

**HAND PULLING**

**MECHANICAL**

**HERBICIDE**

**GRAZING**



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# HAND-PULLING

If your **infestation** is relatively **small**, **hand-pulling** is a **cheap and effective method** for **eradicating** Himalayan balsam.

With such a **shallow root system**, Himalayan balsam can be **entirely pulled out** of the **soil**

**Pull** the plant **firmly** but **slowly** from the **base of the stem**, trying to **keep** the **root system intact**

You should aim to pull Himalayan balsam before it seeds, in June or July

**Pulled plants** should be **left to decompose** in an **open area** or **compost bin**.

Plant material should not be moved from site in case there is contamination by seeds



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# MECHANICAL

**Mechanical methods** are **less labour-intensive** and are useful for tackling **larger infestations**.

Mechanical control should be carried out **before** the **flowering season**.



## TIMING IS CRUCIAL

**Too early** and **re-growth** will occur producing a **higher number of seeds**.

**Too late** and **seed dispersal** will have taken place, **spreading the plant** further.

Plants should be **severed below** the **lowest node** or **joint** to reduce re-growth.



**Cut stems** can be **left to decompose on-site** on a **dry** and **open area**.



Cutting will be **required** for up to **three years**, until no there is **no further re-growth**

Even after Himalayan balsam appears to have been eradicated successfully, it is important to monitor the site for re-growth.



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# HERBICIDE

**Herbicide** should be applied in the **spring BEFORE FLOWERING.**

**BUT** you must ensure **germinating seedlings** have made **sufficient growth** to be **affected** by the spray.

**Herbicide** should be **applied** to **all** the **foliage.**

Using a **selective herbicide** such as 2, 4-D Amine will **reduce** the **impact** on **surrounding vegetation.**

**Herbicide treatment** will be **required** for up to **three years.**

Even after Himalayan balsam appears to have been eradicated successfully, it is **important** to **monitor** the **site** for **re-growth.**

[See advice for preventing future invasion.](#)

Herbicide	Selectivity	When to apply	Use near water	Persistence
Glyphosate	Non-selective – damages grasses	May to October – late season	<b>APPROVED</b> – refer to guidelines	Non-persistent
2, 4-D Amine	Selective	May to October – early season	<b>APPROVED</b> – refer to guidelines	1 month
Triclopyr	Selective	May to October – early season	NO	6 weeks
Picloram	Selective	All year	NO	2 years

**NOTE: IF YOU ARE TREATING JAPANESE KNOTWEED NEAR WATER YOU WILL NEED TO INFORM THE EA OF HERBICIDE USE.**

[SEE HERE](#)

Herbicide concentration for **Glyphosate** is recommended at **5 litres per hectare.**

Studies have found **lower concentrations** of **2 litres** equally **effective.**



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# GRAZING

Grazing has similar effects to hand-pulling or cutting methods.

A stocking density of **20-30 sheep per hectare** is recommended. This should be reduced to **5-10 sheep per hectare** at the end of **June**

**Sheep or cattle** are known to **graze on Himalayan balsam**.

Grazing should be started from **April** and **continue** throughout the **growing season**.

**NOTE: IF HIMALAYAN BALSAM IS GROWING ON A WATERCOURSE, GRAZING DENSITY WILL NEED TO BE CONTROLLED TO REDUCE DAMAGE TO THE BANK.**

In areas of **dense infestations**, it is **recommended** you carrying out **one cut before** starting **grazing** and **plant alternative food sources** to give your livestock a **varied diet**,

As with the other methods of control, **grazing** will need to be **repeated annually** until **no re-growth** appears.



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# INVASION PREVENTION

Once you have successfully eradicated the invasive plant from your land, the area will be exposed and vulnerable to soil erosion and further invasion.

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Photo Credit: othree



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Alternatively, you could bring the land into **crop rotation**.



Photo Credit: Kate Jewell



Photo Credit: Richard Webb

If the infested area was a **natural area**, building a **strong plant community** is recommended.

Some invasive plants, such as giant hogweed, are intolerant of shade. **Establishing wooded areas** would prevent invasion from such species.



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# Giant hogweed

*Heracleum mantegazzianum*

## Species Profile:

**Origin:** Russia

**UK Distribution:** Widespread

**Habitat:** Any environment but common on river banks

**Pathway:** Ornamental plant

**Reproduction:** Reproduces by seed

## Legislation:



**Wildlife and Countryside Act 1981**

**Schedule 9**



**Environmental Protection Act 1990**

**Classified Waste**

## Giant hogweed and the environment

Reaching heights of 5 metres tall, giant hogweed displaces and shades-out native vegetation leaving the undergrowth empty and bare. On a river bank, this bare undergrowth can increase bank erosion and flooding risk.

This plant produces a toxic sap which can cause severe blistering of the skin after sun exposure.

There is no obligation for you to eradicate this species from your land, or to report its presence to anyone. However if this species spreads from your land to the wild or a neighbour's property you could be liable.



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# Giant hogweed

*Heracleum mantegazzianum*

Leaves up to 3 metres across

White umbrella-shaped flower heads up to 80 cm across.

Up to 5 metres tall

Leaves highly serrated and divided

Stem is green, with sharp bristles

Purple-speckled stem



Photo Credit: RPS group Plc



Photo Credit: RPS group Plc



Photo Credit: GBNNS



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# Giant hogweed

*Heracleum mantegazzianum*

You have no obligation to report the presence of giant hogweed on your land.

**HOWEVER, we recommend that you report the presence of giant hogweed to allow us to effectively monitor its distribution and plan larger scale strategic eradication programmes**

It is crucial that we have a good understanding of the distribution of invasive species to understand the extent of the problem in Europe and plan our responses to these threats.

Records of invasive species on farmland are under-represented yet the farming landscape is an integral part of the European environment.

You can be our eyes and ears in the vast farming landscape improving our records and helping us to better tackle the threats from invasive species such as giant hogweed.

## REPORT IT



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# MECHANICAL

When working with giant hogweed you should wear full protective clothing to prevent skin contamination by the sap.

There are three options for the mechanical control of giant hogweed. These are most effective in combination

## OPTION ONE: ROOT CUTTING

Ideal for small infestations

Cutting should occur in the **early spring** and **repeated** in **mid-summer**.

Plant should be cut **10 cm below soil level** severing from the taproot.

Areas on **steep inclines**, taproot should be cut **25 cm below ground**

**Pulled sections** should be **destroyed** or **left to dry out**

**Cutting** should be **repeated** whenever **re-growth** appears and therefore the site requires **regular monitoring**

Application of herbicide following mechanical removal will further reduce likelihood of re-growth



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# MECHANICAL

When working with giant hogweed you should wear full protective clothing to prevent skin contamination by the sap.

There are three options for the mechanical control of giant hogweed. These can be used in combination or alone

## OPTION TWO: MOWING

Ideal for large but short infestations

To prevent further spread, **remove all flower heads** and carefully **dispose** of them **prior to mowing**.

Start mowing when plants are **small** and **continue** throughout **growing season**.

This method will require at least **three cuts** throughout a **growing season** for **several years**

**Clean equipment** before use elsewhere to **avoid spreading** the **seeds** of giant hogweed **off-site**

**DO NOT MOW IF THE PLANTS ARE LARGER THAN YOUR MOWER**



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## OPTION THREE: FLOWER REMOVAL

To be used in combination with another method.

Flower heads should be removed **after** the **seeds** have **formed** but **before** maturation.

Place **cut flower heads** in **sturdy bags** and **seal** tightly

If **sap** is found on the outside of the bag, **double bag** for your **protection**

Place in **secure location** where they are **exposed to direct sunlight**. After **two weeks**, flowers and seeds will have been **destroyed** by **sun exposure**.

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# HERBICIDE

**Herbicide** should be applied in the **between late April and early June.**

**Follow-up** treatment in **July** or **August** is recommended

**Removing flower heads** will **reduce** next year's **re-growth**

**Herbicide** should be **applied to all the foliage.**

Using a **selective herbicide** such as **triclopyr** will **reduce** the **impact** on **surrounding vegetation** and **prevent giant hogweed germination** as it is **intolerant of shade.**

**Herbicide treatment** will be **required for multiple years.**

**Regular monitoring** for **re-growth** will be **necessary**

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**NOTE: IF YOU ARE TREATING JAPANESE KNOTWEED NEAR WATER YOU WILL NEED TO INFORM THE EA OF HERBICIDE USE.**

[SEE HERE](#)

If plants are **tall**, you should **cut them down** to the **taproot** or to **waist height** and **spray.**



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# GRAZING

Ideal for large stands of hogweed **HOWEVER** plants must be young to be palatable to grazers

A stocking density of **20-30 sheep per hectare** is recommended. This should be reduced to **5-10 sheep per hectare** at the end of **June**

**Sheep, cattle, pigs and goats** are known to **graze on giant hogweed**.

Grazing should be **started early** in the growing season when plants are **young and small**.

The grazing area should cover infestation and **surrounding area** to **allow for seed dispersal**.

**SAFETY WARNING:** Livestock can be affected by the sap, showing symptoms including skin inflammation and blistering.

It is recommended you monitor your livestock for such symptoms.

Selecting livestock which are **hairy** and have **dark pigmentation** where skin is bare will **reduce** the **impact** of the **sap**.

To give your livestock a **varied diet**, it is recommended you carrying out one cut before starting grazing and **plant alternative food sources**.

**NOTE: IF GIANT HOGWEED IS GROWING ON A WATERCOURSE, GRAZING DENSITY WILL NEED TO BE CONTROLLED TO REDUCE DAMAGE TO THE BANK.**



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Photo Credit: othree



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# INVASION PREVENTION

Once you have successfully eradicated the invasive plant from your land, the area will be exposed and vulnerable to soil erosion and further invasion.

To reduce the likelihood of further invasion it is **recommended** that you **bring the area into regular use**.

Alternatively, you could bring the land into **crop rotation**.



Photo Credit: Kate Jewell



Photo Credit: Richard Webb

If the infested area was a **natural area**, building a **strong plant community** is recommended.

Some invasive plants, such as giant hogweed, are intolerant of shade. **Establishing wooded areas** would prevent invasion from such species.



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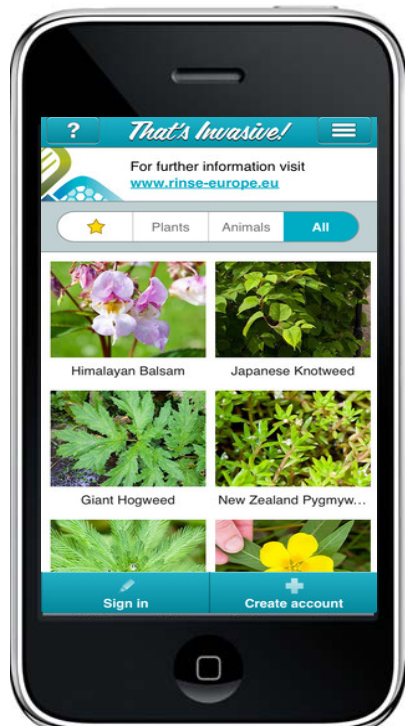
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# REPORTING

Reporting the presence of any invasive non-native species on your land is of high importance. Without a detailed picture of their distribution, appropriate control and eradication projects are flawed.

## Smartphone App



RINSE have created a free Smartphone app for recording invasive species.

### 'That's Invasive'

This easy to use app helps you to **identify** and **record invasive species**.

A **library of species biology, ecology, identification and images** will be **available** at the click of a finger allowing you to **identify, photograph and record** over **35 invasive non-native species** commonly found within Europe.



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## Online Recording



**iRecord** – an **online environmental database** for **managing** and **sharing** your **wildlife records**.

You can **submit your invasive species sightings online**. All you need is: the **species** you saw, **where** you saw it (preferably a grid reference), the **date** you saw it and **your name**.

**SUBMIT YOUR RECORD NOW**



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**RINSE (Reducing the Impact of Non-native Species in Europe)** is an exciting new European project seeking to improve the management of invasive non-native species (INS) across four partner countries in western Europe. RINSE will also increase awareness of the threats posed by INS, and the most effective methods to address them. The project has been part-funded by the European Union (European Regional Development Fund) delivered through the Interreg IVA 2 Seas Programme.

[www.interreg4a-2mers.eu](http://www.interreg4a-2mers.eu)

[www.europa.eu/regional\\_policy/index\\_eu.cfm](http://www.europa.eu/regional_policy/index_eu.cfm)



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**RINSE**



**Norfolk** County Council

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