



Healthy Creeks Initiative to Combat Invasive Arundo

The 'Healthy Creeks Initiative' is a partnership with landowners on the Blanco and Pedernales Rivers that are interested in taking steps to improve the health of their riparian areas.

What is Arundo? *Arundo donax*, also commonly called Giant Reed or Carrizo Cane, is a highly invasive, non-native grass with the potential to significantly impact the health of Hill Country streams and rivers.

How does Arundo impact me and my river or creek? Arundo consumes large quantities of water, reducing base flows vital to the health of the native invertebrates, fishes, and plants in the creek and reduces water quality. It contributes to flooding by obstructing the floodplain's ability to evenly dissipate flood energy. Arundo is a "game-changer" for the riparian area of these streams. It displaces native riparian vegetation and its comparatively shallow roots can lead to increased bank erosion and damage to private property. Diverse, native vegetation is important for wildlife that depend on riparian areas, and when the native plant community is replaced by Arundo, the habitat may become more favorable for invasive, feral hogs and nutria. Arundo is also a fire hazard—it is highly flammable and substantially increases danger of wildfire occurrence, intensity, and frequency and decreases the riparian areas' ability to act as a firebreak.

Why manage Arundo in the Hill Country? Ultimately, our goal is to help restore healthy stream function and habitats beside and within the creek—including improving habitat for our state fish, the Guadalupe Bass, which is exclusive to the Texas Hill Country. However, management of Arundo and encouragement of healthy, native vegetation can also help to reduce erosion and risks associated with flooding and wildfires and help the riparian area act like a "sponge" to absorb water.

How can I manage Arundo on my property? A control program is underway on Hill Country streams to provide no-cost herbicide application for landowner partners. Mechanical treatment, such as cutting, mowing, or tilling, is not allowable, because floating stalk fragments will take root on downstream properties. Burning is not recommended, because Arundo growth and expansion is stimulated by fire.

How can I sign up to participate in the Healthy Creeks Initiative? If you have Arundo on your property, email us at healthycreeks@tpwd.texas.gov or call Ryan McGillicuddy (Blanco River) at 512-552-3713 or Monica McGarrity (Pedernales River and tributaries) at 512-552-3465. We would like to visit with you at your property to talk about the initiative and the treatment. In order to participate in the initiative, you'll need to sign a landowner permission form that grants us or our contractors access for treatment and monitoring.

Strong landowner support all along your river or creek is important to the success of this initiative—so be sure to let your neighbors know you're a proud Healthy Creeks Initiative participant!



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Why Herbicides? Although mechanical removal of very small patches or freshly rooted fragments can be very effective, especially when they're growing in the creek, for large patches this method is labor intensive and too expensive. Successful mechanical removal requires removal of all of the roots which can damage and destabilize banks, leading to erosion and damage to private property. Fragments of *Arundo* could travel downstream and cause new infestations. Herbicides, when used responsibly, can minimize the impact on the riparian habitat. By leaving treated canes and roots in place while the plant dies, we can provide stability to the soil, reduce erosion, and create a nursery area to allow regrowth of native plants. When large patches of *Arundo* are treated, planting may also be used to restore the native vegetation.

Which Herbicides are used for *Arundo*? Responsible pesticide selection and application is the key to reducing the risks. Herbicides used to treat *Arundo* (or any Nuisance Aquatic Vegetation) must be approved by the EPA for use over water. These herbicides (not only the active ingredient but also other additives) have been rigorously tested and found to have minimal risk to aquatic life, in addition to the standard testing required for all pesticides. Herbicides we are using to manage *Arundo* include the active ingredients glyphosate and imazamox. These herbicides are applied only once per year and at very low concentrations—the herbicide 'mix' usually contains around 1.5 parts herbicide to 98.5 parts water. These herbicides have extremely low toxicity and low tendency to runoff into surface waters but high tendency to be bound in the soil where they break down rather than moving through the soil into ground water. We use licensed pesticide applicators who take measures to minimize drift and overspray onto the water or adjacent non-target plants by spraying during low-wind conditions and adjusting droplet size using different pressure and nozzle combinations. In addition to the precautions certified applicators take to keep herbicide applications on target, they also add surfactants to the herbicide mixture to help penetrate the dense *Arundo* canopy for effectiveness and to speed up drying which further reduces the risk of runoff into surface waters.

About the Healthy Creeks Initiative. The Healthy Creeks Initiative (HCI) is a partnership to improve the health of riparian (creekside) habitats in the headwaters of the Pedernales and Blanco River watersheds. *Arundo* (*Arundo donax*) is a highly invasive plant that threatens the health of aquatic systems and riparian habitats across the state and has become increasingly problematic in the Hill Country in recent decades. Management of this invasive plant is high priority for improving creek health. TPWD, with a group of partners, provide coordination, outreach, funding, and implementation of efforts to manage invasive *Arundo* and other species in priority areas, monitor plants and aquatic life on Barons Creek, and work to increase awareness of best management practices for creek health.

How Can I Learn More? Visit <http://www.tinyurl.com/healthycreeks> or email us at healthycreeks@tpwd.texas.gov

Aquatic Invasive Species have Significant Economic Impacts in Texas. It's estimated that the annual economic impact of aquatic invasive species in the US is more than \$140 billion, and globally, the impacts are estimated at more than \$4 trillion. Texas Parks and Wildlife Department estimates that effective management of aquatic invasive species in Texas would require \$45 million annually.



Top: Certified pesticide applicator carefully targets *Arundo*.

Bottom: *Arundo* shows signs of treatment after only a few weeks.



Hand pull new sprouts to keep them from taking root.



Healthy Creeks Initiative: Participation & Next Steps

Please review this fact sheet for more information about how to join the Healthy Creeks Initiative and what to expect as a participant. Remember—you should NOT mow or till Arundo! This invasive grass is easily spread and floating cut stalks (even a very small fragment) can spread this invader to your downstream neighbors.

Contact Us

To learn more or sign up for the Healthy Creeks Initiative, email us at healthycreeks@tpwd.texas.gov.

If you don't have email, call:

Blanco River—Ryan McGillicuddy—512-552-3713

Pedernales River and tributaries—Monica McGarrity—512-552-3465

Attend an Information Session

Informal get-togethers are periodically held in Fredericksburg, Blanco, Wimberley, and other locations. For details on any upcoming workshops, see the information included with this handout or feel free to email or call us any time for more information. You can also visit our webpage at <http://tinyurl.com/healthycreeks> We would love to visit with you in person!

Personal Site Visit

After you've signed up for more information, either by email or at an information session, we'll contact you personally to try to schedule a site visit to see and measure the Arundo on your property, talk about riparian health and management options for you, learn about your specific needs, and answer your questions about treatment. **Before or at the time of the visit, you'll need to sign a permission form to allow us and our contractors access to your property to provide treatment and follow-up monitoring.** You'll also get to specify how your information is shared.

Initial Herbicide Application (No Cost)

Licensed, professional herbicide applicators will carefully apply aquatic-labeled herbicides to the Arundo on your property during the summer. You will be notified in advance of the application date(s), although the exact date/time may change with weather and contractor schedule.



Involved landowners attend a 'Healthy Creeks' information session.



Landowner overshadowed by Arundo along the creek on his property during a site visit.



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SOUTHEAST AQUATIC RESOURCES PARTNERSHIP





Left: Licensed applicator carefully applies aquatic herbicide. Center and right: A few weeks later, canes show signs of damage.

What to Expect After Treatment

- **Post-treatment site visit (we will visit 3-4 weeks after treatment)**
- **Browning/dying canes:** After treatment, the canes will begin to turn brown quickly—in a matter of weeks. They will remain in place, and will look very much like they do during the winter months.
- **Nontarget damage to other plants:** We will take care to reduce non-target damage, but some damage to desirable plants may be unavoidable. Grasses are especially susceptible but will usually regrow quickly. Trees with brown leaves on a few branches will also usually recover quickly. Take photos of damage and email them to us if you have questions.
- **Leave it alone!** After herbicide treatment, it can be tempting to cut or mow the canes. Leaving them in place creates a nursery area for native plants to grow and helps keep it from re-sprouting or spreading.
- **Monitor regrowth:** The initial herbicide treatment may not completely kill the plant—retreatment will likely be needed. You can watch for green growth, new shoots, or “pups” (side shoot growth).
- **Native/invasive plant emergence:** Soon, native plant seedlings will sprout among the canes. Unfortunately, we’ll also need to watch for other invasive plants such as privets, Chinaberry, and Chinese tallowtree. Take photos and email us if you have questions.
- **Follow-up visits:** We or our contractors will also be monitoring the effectiveness of the treatment and positive benefits to the creek. You will be notified of the monitoring visit date(s) if we need to enter the property.



Dying canes after treatment.



Re-sprouting and side shoot “pups” may appear — watch closely!

Retreatment and Revegetation

Retreatment may be needed—especially for large patches of *Arundo*. Achieving effective control often requires more than one herbicide application. By monitoring the treatment’s effectiveness, we’ll be ready to re-treat next year, and even revise treatment plans if necessary.

Revegetation, whether natural or through seeding/planting, is an important part of riparian restoration. In most cases, native plants will naturally recolonize the area. We may offer to re-seed large patches with Riparian Recovery Seed mix from Native American Seed—a blend of grasses and wildflowers selected for their ability to stabilize stream banks. For extreme infestations, planting native trees among the canes after treatment may be advised.



LANDOWNER PERMISSION FOR INVASIVE PLANT MANAGEMENT & RESEARCH

(Pursuant to Section 12.103 of the Texas Parks and Wildlife Code)

By my signature below, I hereby authorize Texas Parks and Wildlife Department (Department) employees, or persons working on behalf of the Department, to enter private property I own or manage for the purpose of managing invasive plant wildlife species (i.e., herbicide application, biological control agent introduction, or mechanical treatment/removal) or conducting scientific research and investigation regarding invasive species and natural resources, to record and use site specific information from the property for scientific research and investigation, and to allow public access to the information to the degree authorized below.

Mapping Arundo and other invasive plants, treatment of Arundo and other invasive plants using herbicide or other methods, monitoring treatment effectiveness and habitat/wildlife before/after treatment.

(Authorized scientific research, investigation, management practice, or other activity)

OPTION 1 - Release of Information (Location Specific): I hereby further authorize the Department and project partners to use the information collected in reports, maps, publications, or presentations or otherwise make the information available to the public in a manner that could identify the specific location of the private property I own or manage but does not reveal my name or exact address.

Signature (Landowner or authorized agent)	(Date)
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OR

OPTION 2 – Limited Release of Information (Non-Location Specific): I hereby further authorize the Department and project partners to use the information collected in reports, maps, publications, or presentations or otherwise make the information available to the public only in a manner that is generalized to a level that does not identify the specific location of private property I own or manage and does not reveal my name or exact address.

Signature (Landowner or authorized agent)	(Date)
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Name and Address: (Please print legibly)

(Name of Landowner or Authorized Agent)		
(Property, Ranch, or Tract name, if applicable)		
(Address)		
(City)	(State)	(Zip)
(Home Phone)	(Mobile Phone)	
(Email Address)		

Texas Parks and Wildlife Department maintains the information collected through this form. With few exceptions, you are entitled to be informed about the information we collect. Under Sections 552.021 and 553.023 of the Texas Government Code, you are also entitled to receive and review the information. Under Section 559.004, you are also entitled to have this information corrected. For assistance call 512-389-4444.