



5th Edition

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### Of Special Interest:

- Protecting property in the Floodplain and people during a flood
- Polluted stormwater harms fish and wildlife

## Remember . . .

**POLLUTANTS THAT ENTER HERE:**



**END UP HERE:**



# A Stormwater Guide for Homeowners

## APRIL 2019

### *Trashin' the River*

Trash in the Roanoke River has reached epic proportions. It mars the majestic mountain scenery, ensnares wildlife, and degrades water quality. Take a stroll along the mighty Roanoke River and look around. Trash, especially plastic trash, is stuck on trees, wound up in shoreline grasses, and caught on rocks and tree limbs. It is everywhere that it doesn't belong, both in and along the waterway.

The real question is, from where does all this trash come? Who 'put' it there and why? The sad and real answer is that discarded trash comes from *p e o p l e*. Yes, people. You see, people throw trash out of their car windows; people leave trash on pristine hiking trails; people flick cigarette butts on the ground; and yes, people drop trash overboard, into roadside ditches, and at their campsites. People are the culprit of the trash-ending-up-in-the-river issue. But how does the trash actually get *in* or *to* the river? It travels from the very spot where it was discarded, sometimes quite far upstream, by way of stormwater runoff. This runoff finds its way to the nearest underground pipe system, drainage swale, ditch, or stream, where it is then carried, untreated, to the Roanoke River. Trash can also be dropped or blown directly into the river.



*Pollutants and trash reach the Roanoke River and its tributaries through storm drainage inlets and underground pipes.*

So, how do we stop it? **We stop littering.** We throw all of our trash into a trash can; we bring all of our trash back from our outdoor camping, hiking, canoeing, fishing, paddling, hunting, horseback riding trips, etc. We bag the trash. We take personal responsibility. And, we educate our youth to have an appreciation for Mother Nature, with the sincerest hope that they will grow into responsible stewards of this great place we call home. Together, we keep the County beautiful! ■



## Floodplains and Flooding

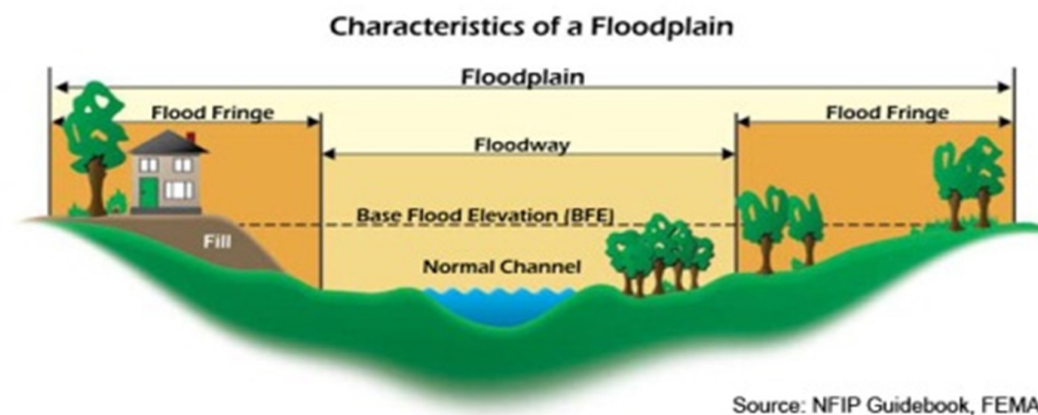
Excessive rainfall often results in flooding. Such flooding can be categorized into three major types: (1) stream flooding, (2) storm drain system flooding, and (3) flooding related to site issues. Each of these are discussed in more detail below:

- **Stream Flooding** - Flooding within mapped floodplains or along small streams where floodplains are not mapped. Flooding happens when the rain occurs in large enough amounts (and short duration) to cause the waterbody (stream, creek, or river) to swell such that the water overflows its banks. The majority of flood damage occurs along streams. Areas with high risk of flooding are identified on the Federal Emergency Management Agency's (FEMA) Flood Maps, which are online at <https://msc.fema.gov/portal/search>
- **Storm Drain System Flooding** - Flooding due to stormwater runoff volume being greater than the storm drainage system's capacity, which is exacerbated when the storm drainage system is clogged with trash and/or debris.
- **Flooding Related to Site Issues** - Flooding due to inadequate building gutters, downspouts, and area drains; poor site drainage; high groundwater; or sanitary sewer back-ups.

Damages can also occur due to rain-saturated soils triggering mudslides and retaining wall failures and due to stormwater eroding stream banks or depositing sediments.

Properties that are located within the mapped floodplain are especially susceptible to impacts from stream flooding. This is of concern, because there are 4,311 properties in Roanoke County that are wholly or partially located within the floodplain. Of those, 2,417 are in the floodway, 3,654 are in the 100-year floodplain, and 3,521 are in the 500-year floodplain. (Note that some properties are in one or more of these zones.) If YOUR property is located within a floodplain, it is wise to learn about and understand the inherent risks associated with flooding and what you can do to minimize such risks.

### What is a Floodplain?



A floodplain is that area of land along a stream or creek that spans from the top of the channel's banks on one side and across the creek itself to the top of bank on the opposite side. It includes both the **floodway** and the **flood fringe**, which are both described in more detail below:

The FEMA floodplain comprises two parts:

**Floodway** - The stream channel and portion of the adjacent floodplain that must remain open to permit passage of flood waters up to the base flood (100-year storm). The floodway boundary is set by performing an analysis to model filling of the floodplain. This “squeezes” the flood waters towards the channel and causes the flood level to rise. At the point where the flood level rises by 1 foot, the floodway boundary is set.

**Floodplain Fringe** - Consists of the remainder of the floodplain adjacent to the floodway. The boundary is set at the base flood elevation (100-year flood). The concept of the 100-year flood is based on probabilities. At the boundary of the 100-year floodplain, there is a 1% chance of annual flooding.

### What should I do to protect my property in the floodplain?

- Buy flood insurance. According to FEMA, “even if your property is not in a high-risk zone, you may need flood insurance because most homeowners insurance doesn't cover flood damage. If you live in an area with low or moderate flood risk, you are 5 times more likely to experience flood than a fire in your home over the next 30 years. For many, a National Flood Insurance Program's flood insurance policy could cost less than \$400 per year. Call your insurance agent today and protect what you've built.”
- If you have drainage inlets on or near your property, keep them clear of grass and leaves to ensure that they can accept stormwater runoff during rain events. This will help to minimize street and yard flooding.
- Make sure all sheds and accessory structures are built outside of the floodway. Be sure to get a building permit!
- Clean out gutters and downspouts.

### What does the County do to protect properties in the floodplain?

The County is NOT responsible for maintaining private property in or outside of the floodplain; it is the property owner who is responsible for maintaining their own property.

However, the County does have a storm drainage team, which includes 9 full-time employees. This group performs many services associated with County-owned infrastructure, including:

- Maintains and improves the County-owned drainage system
- Mows and cuts brush in public drainage ways
- Cleans County-owned culverts and inlets
- Repairs County-owned channels and pipes
- Improves drainage systems located in public (non-VDOT) easements
- Services and maintains County-owned equipment
- Performs miscellaneous snow removal and other work at County-owned buildings
- Responds to citizen drainage concerns



*Serious flooding occurred across Roanoke County during the remnants of Hurricane Michael*

#### DUE DILIGENCE tips

- Purchase flood insurance
- Keep drainage ways clear
- Clean drainage structures
- Clean roof gutters



A young boy with sunglasses on his head, wearing a blue hoodie and brown overalls, stands in a grassy field. He is holding a dead fawn skull in his right hand. The background shows a stream and more grass.

**Polluted  
stormwater  
poisoned this  
fawn**

# **Clean Stormwater**

*Wildlife Depend On It*

**Polluted stormwater taints creeks, streams, and rivers,  
which harms fish, deer and other wildlife, and their habitats**

*Do your part . . . be Stormwater Smart*

- Throw trash in a trash can
- Pick up after your pet
- Limit lawn fertilizers
- Bag or compost leaves & grass clippings
- Use a drip pan when changing your vehicle's oil
- Throw **NOTHING** in a storm drain, ditch, stream, or creek



## Preparing for a Flood

As a property owner, getting ready for a flood is the best thing that you can do to minimize flood damage and losses to your buildings and personal property. FEMA<sup>1</sup> suggests the following steps to keep you and your belongings protected.

### PERSONAL PROTECTION

#### EVACUATE

To avoid being trapped when flood waters threaten your area, the best action to protect yourself and your family is to evacuate before flooding starts. Know and follow the directions from local officials for community evacuation or seek high ground for localized flooding. If you do not evacuate before the flooding occurs or you are trapped by flash flooding, do not enter flooded areas or moving water either on foot or in a vehicle, including areas that appear to have only inches of water.

### PROPERTY PROTECTION

#### ELEVATE, WATERPROOF, AND CLEAR DEBRIS

Your goal now, before a flood occurs, is to reduce the risk of damage to structures from flooding. This means elevating critical utilities, such as electrical panels, switches, sockets, wiring, appliances, and heating systems, and waterproofing basements. In areas with repetitive flooding, consider elevating the entire structure. Make sure that basements are waterproofed and that your sump pump is working and then install a battery-operated backup in case of a power failure. Installing a water alarm will also let you know if water is accumulating in your basement. Clear debris from gutters and downspouts. Anchor any fuel tanks. Move furniture, valuables, and important documents to a safe place.

### RISK MANAGEMENT

#### OBTAIN FLOOD INSURANCE

Purchasing flood insurance provides financial protection for the cost of repairs due to flood damage. Standard insurance policies do not cover flooding, but flood insurance is available for homeowners, renters, and business owners through the National Flood Insurance Program (NFIP).

Visit [www.floodsmart.gov/floodsmart/pages/flooding\\_flood\\_risks/defining\\_flood\\_risks.jsp](http://www.floodsmart.gov/floodsmart/pages/flooding_flood_risks/defining_flood_risks.jsp) for an estimate of what flood insurance may cost for your property address. A policy purchased today will take effect in 30 days, so act now.

### REDUCING FLOOD INSURANCE COSTS

#### BE PROACTIVE TO REDUCE YOUR PREMIUM. FEMA

identifies 5 major ways to lower the cost of flood insurance, which includes (1) relocating your home out of the base flood elevation; (2) relocating your utility services and equipment above the base flood elevation; (3) installing proper flood openings in your building; (4) filling in existing basements that are in the floodplain; and (5) elevating your house and accessory buildings above the base flood elevation. For more detailed information about these measures, see FEMA's brochure entitled *Cheaper Flood Insurance*. It is available online at [https://www.fema.gov/media-library-data/20130726-1622-20490-2266/fema\\_d671.pdf](https://www.fema.gov/media-library-data/20130726-1622-20490-2266/fema_d671.pdf).

<sup>1</sup> FEMA. How to Prepare for a Flood. [https://www.fema.gov/media-library-data/1409002852888-c5d1f64f12df02aa801901cc7c311ca/how\\_to\\_prepare\\_flood\\_033014\\_508.pdf](https://www.fema.gov/media-library-data/1409002852888-c5d1f64f12df02aa801901cc7c311ca/how_to_prepare_flood_033014_508.pdf)

## Flood Safety

Most of the flooding in Roanoke County is caused by flash flooding. Flash flooding occurs when natural and engineered drainage conveyances overflow from heavy or steady rain, causing serious flooding in a short time. Stormwater can flood buildings, yards, bridges, and streets in flood-prone areas. Flash floods are powerful and require quick action to avoid tragedy. **Drowning is the number one cause of flood-related deaths. Electrocuting is second.** To reduce risk of injury or death, follow these procedures in the event of a flood.

- Floods are the #1 natural disaster in the United States
- Real-time flooding updates: [www.usgs.gov](http://www.usgs.gov)
- Other useful websites: [www.fema.gov](http://www.fema.gov), [www.weather.gov](http://www.weather.gov), [www.floods.gov](http://www.floods.gov)

### FLOOD SAFETY TIPS

1. **Be aware of flood warnings.** When there is a threat of flooding, listen to local radio/TV stations for advice.
2. **Stay away from flood waters.** If you come upon a flowing stream where water is above your ankles, stop, turn around, and go another way. Six inches of swiftly moving water can sweep you off of your feet.
3. **Keep children away from flood waters.** Flood waters are not only dangerous but also may be contaminated with hazardous materials and poisonous snakes.
4. **Do not drive into flooded roadways or around barricades.** If you are caught on a flooded road and waters are rising rapidly around you, quickly get out of the car and move to higher ground. Most cars can be swept away by less than one foot of moving water.
5. **Stay away from power lines.** If power lines are down, do not step in puddles or standing water. Report downed wires to AEP at 1-800-277-2177.
6. **Turn off all utilities.** Turn off gas and electricity service, unplug electric appliances, and be alert for gas leaks.
7. **Be cautious upon returning to your home.** Be alert for possible gas leaks, debris that may have been washed into your house, and wild animals that may have sought shelter during the flood.
8. **Clean everything that got wet.** During cleanup, wear protective clothing, including rubber gloves and boots, to protect yourself from sewage and chemical contaminations. If an item cannot be cleaned, throw it away.
9. **Take care of yourself.** Read *Repairing Your Flooded Home* for more tips on caring for yourself and your family following a flooding event. This document is available on the County's website and at Roanoke County's South County Library, 6303 Merriman Road, Roanoke, VA 24018.



Do not drive into flooded roadways or around barricades. Turn around and go another way! Most cars can be swept away by less than one foot of moving water.





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This publication is a public service message brought to you by Roanoke County, Department of Community Development. As regulated by federal and state laws, the County's Stormwater Management Program must include public information strategies to encourage the prevention of stormwater pollution. For more brochures or information on ways to prevent stormwater pollution, please contact the County's Department of Community Development, Division of Stormwater Management, at 540-772-2065.

**Pups Poop**  
*People Scoop*  
**Do it.**



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