

Local Wetlands and Watercourse Regulations

Potential Tools for Floodplain Management

Lessons from Three New York Towns

A.R. Siders, L. Gerber-Chavez, S. Adams, D. Richardson, K. Reece
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***The analysis provided in this report does not, and is not intended to, constitute legal advice; the intent is to provide content for general information purposes only.*

Summary

Local land use regulation has been described as one of the most powerful tools available to address flood risk. Using zoning laws, building codes, and permit reviews, local governments can influence both where and how development occurs, thereby shaping local flood exposure. Land use regulations can also preserve natural resources, such as wetlands and watercourses, that provide flood management services (among other benefits). Federal and state regulations may provide some protection to these resources, but local authorities have the opportunity to protect a wider range of wetlands (including small or isolated wetlands and vernal pools) and watercourses (including intermittent and ephemeral streams).

In a 2013 New York State survey, Riverkeeper, Inc. found that 78 municipalities had adopted wetland and watercourse regulations above and beyond those required by state law. As our analysis of Dutchess, Ulster, and Westchester counties illustrates, however, these regulations are not evenly distributed or necessarily adopted in areas of highest flood risk. We find that 78% of Westchester County municipalities have adopted wetland and watercourse regulations, while only 54% of Dutchess County municipalities have done so, and just 28% in Ulster County. Widespread adoption of wetland and watercourse regulations could significantly increase the ability of municipalities to govern their floodplains. A spatial analysis estimates that widespread adoption would increase the amount of the floodplain regulated by local governments by 40% in Dutchess County, 47% in Ulster County, and 59% in Westchester County, relative to New York State wetland laws. Towns within these counties would be able to regulate 70-80% of their flood-prone lands, on average: an increase from 10-30% under New York State wetland laws.

To understand why some towns have adopted these regulations, and how they overcame the challenges inherent in adopting new local laws, we interviewed practitioners in three towns that have successfully adopted local wetland and watercourse regulations: East Fishkill, Dutchess County; New Paltz, Ulster County; and New Castle, Westchester County. While wetland and watercourse regulations could offer significant benefits, adoption of these laws often requires local champions to describe multiple benefits of wetland and watercourse buffers, drawing on local values. These could include flood risk mitigation but may also involve pollution control, water quality, recreational opportunities, or preservation of habitat for charismatic animals. Local leadership is critical, and non-governmental organizations have played a key role in providing scientific expertise and educational outreach support. Scientific expertise can ensure that regulations draw on the best available science, but overly technical regulations can complicate efforts to explain the value of the law to officials and residents and can make enforcement more challenging. In some cases, simple language and laws may be easier to adopt and implement. Enforcement of wetland and watercourse regulations relies on continued leadership by officials on planning and zoning boards and the willingness of residents to engage in the permitting process and to resolve violations.

Wetland and watercourse regulations share some goals with regulations on floodplain management, critical habitat preservation, and open space. Some officials report increased resistance to (or at least decreased enthusiasm for) new regulations when a town attempts to adopt several of these regulations in quick succession. Towns planning to adopt one or more of these tools should strategically consider their messaging and timing or consider pursuit of a comprehensive regulation that could address multiple goals simultaneously.

Introduction

Flooding is the most common and expensive hazard in the United States. Floods have touched every state in the nation, and 90% of presidentially declared disasters involve flooding. Already an estimated 41 million Americans live in flood-prone areas (7), and U.S. floodplains are expected to grow 45% by the end of the century (2). Urbanization and development can exacerbate flood risk, for example, by altering stream channels, changing the grade of the land, increasing runoff on impervious surfaces, and destroying or degrading natural systems (3).

Efforts to reduce flood risk are often categorized as resistance (e.g., building floodwalls to prevent flood waters from reaching people or infrastructure), accommodation (e.g., elevating homes so floodwaters cause less damage), avoidance (e.g., limiting new development in high-risk areas), and retreat (e.g., moving existing buildings away from floodplains) (4). Regulations that guide development and activities in and around wetlands and watercourses can both help avoid exposure of people and buildings to floodwaters and help accommodate and resist floods.

Healthy wetlands and watercourses can reduce flood risk by reducing erosion, filtering stormwater,



NOAA. Flooding in Binghamton, NY

and directing and slowing the rate of flow. Watercourses direct stormwater and runoff away from urban centers and towards waterbodies and wetlands. A one-acre wetland can store the same amount of water that would flood an acre of dry land three feet deep: about one million gallons (5). By storing this water and releasing it slowly, streams and rivers are less likely to erode or overtop their channels, which reduces the risk of flooding downstream. Ecosystems around wetlands and watercourses (buffer zones) absorb pollutants and stabilize soils to prevent erosion and keep these natural resources healthy and functioning.

Federal and New York State laws protect large wetlands and watercourses, but local regulations could protect a wider range of natural resources as a means of helping to address future floods. In this report, we estimate how widespread adoption of local wetland and watercourse regulations in three New York counties could affect the management of floodplains. We explore the challenges towns face when adopting and enforcing these regulations through case studies and lessons learned in East Fishkill, Dutchess County; New Paltz, Ulster County; and New Castle, Westchester County (Figure 1).

Our goal is to provide information for towns that are considering adopting or revising local wetland and watercourse regulations. Based on our analysis, we identify several lessons towns should consider, but the analysis is not and should not be considered legal advice; towns should consult with a local attorney to tailor wetland and watercourse regulations to their local context.

Background

Local governments are primarily responsible for guiding development in flood-prone areas. Generally, this involves building codes and permitting restrictions that dictate how buildings should be constructed (e.g., how high they must be elevated). It is less common for floodplain regulations to limit development in flood-prone

areas, though this has been strongly recommended (6, 7) and larger amounts of open space and tightly clustered development have been linked to fewer flood losses (8, 9). The federal government has no legal authority to regulate local land use, and New York State provides direction for construction in floodplains but does not limit floodplain development.

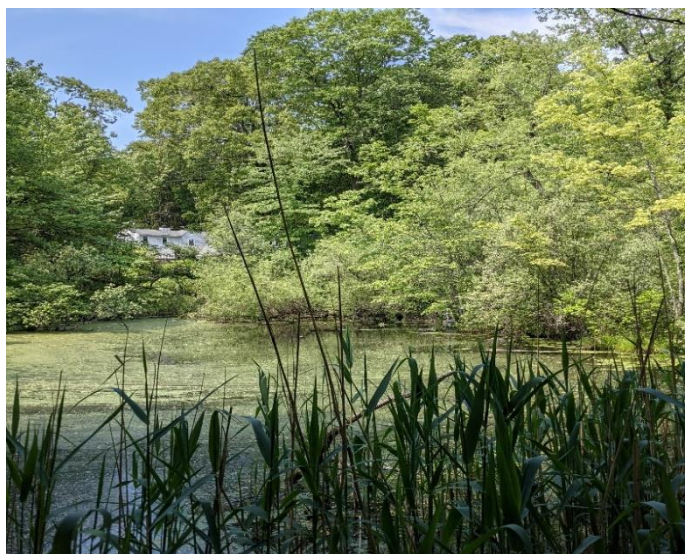
Limiting development in and around wetlands and watercourses could limit development in floodplains, especially in towns where the floodplain significantly overlaps with wetlands and watercourses. In other towns, lands far distant from wetlands and watercourses will still be flood-prone (e.g., an area of low elevation that only floods during a storm or heavy rain). The spatial analysis in this report is intended to assess how closely the floodplains in Dutchess, Ulster, and Westchester Counties overlap with the wetlands and watercourses in those counties. This analysis depends, to some extent, on which wetlands and watercourses are included. For example, if only large wetlands and rivers are considered, the overlap with floodplains may be minimal, but if smaller wetlands and streams are included, the overlap may be more extensive (see spatial analysis p.14). The potential for wetland and watercourse regulations to affect floodplains therefore depends on both the local geography and what wetlands and watercourses are included in the regulation.

Limiting development in and around wetlands and watercourses could also maintain the health of these ecosystems and their ability to provide flood mitigation services. The ability of coastal wetlands to reduce storm damage has been well-documented (e.g., 10, 11), but inland, freshwater wetlands also provide significant services. Indeed, worldwide, inland wetlands are estimated to provide Int\$27 trillion in services (International dollars) (12). In addition to reducing flood risk, wetlands improve water quality, provide habitat for numerous species, sequester carbon, and offer recreational opportunities and green spaces that provide

physical and mental health benefits (see 10, 12–14). Despite these services, the U.S. Fish and Wildlife Service estimates that more than half of U.S. wetlands have disappeared due to human action (15).

At the federal level, the Rivers and Harbors Appropriation Act of 1899, 33 USC §403 et seq., and Federal Water Pollution Control Act of 1972, 33 USC §1251 et. seq., generally referred to as the Clean Water Act (CWA), provide legal authority for federal governance of wetlands and watercourses (16). This authority is derived from the government’s role in protecting the ‘waters of the United States.’ However, U.S. Supreme Court cases in 2001 and 2006 led to a narrowing in how the government defines the ‘waters of the United States,’ which has limited the number and type of wetlands and watercourses the federal government can protect (16). An analysis of one watershed found that 39% of wetlands in that region would no longer be protected under the new definition (17). A similar analysis of watercourses in the National Hydrography Dataset found that roughly a quarter of U.S. stream channels lose protection (18).

New York State protects freshwater wetlands under the Freshwater Wetlands Act (Article 24 of the Environmental Conservation Law), but only those larger than 12.4 acres or that have “unusual local



Pinecliff Sanctuary, New Castle NY

significance” (§24-0301). The law also regulates a 100-foot buffer zone around these wetlands, and the law is administered by the Department of Environmental Conservation (NYSDEC). As a result of this large size limit, NYSDEC only regulates about half the wetlands mapped by the U.S. Fish and Wildlife Service National Wetland Inventory (USFWS NWI) in New York (19). In January 2021, a bill was introduced to the New York State Senate that would authorize NYSDEC to regulate freshwater wetlands larger than one acre (S2979).

The NYSDEC also administers the Protect the Waters Program under the state’s Water Resources law (Article 15 of the Environmental Conservation Law). Permits are required to alter any bodies of water suitable for drinking, swimming, and fishing. Alterations include, for example, shore stabilization, dams, bridges or stream crossings, and fill. A law that would have protected even smaller streams was vetoed by Governor Cuomo in 2020 (20). Both the watercourse and the ‘bank’ – the land that slopes down to the water, up to 50 feet or the first crest when the slope is 45 degrees – are regulated, though the surrounding area (buffer) is not regulated (27).

Buffer zones – a vegetated space around wetlands and watercourses – provide a variety of important services including shoreline stabilization, water quality, habitat, and groundwater recharge (22–24). Surface runoff is slowed by vegetation in the buffer, which helps to filter pollutants and sediments before the water enters the wetland or watercourse. Strong root systems in the buffer help prevent erosion by stabilizing the soil and slowing the speed of the water, which is especially important in streams and rivers that experience floods. In some places, the buffer zone provides aesthetic and recreational value and may even increase property values (25).

Nationally, more than 5,000 local governments have adopted wetland and watercourse regulations (26), and at least 78 New York municipalities have wetland and watercourse laws (27). Wetlands, watercourses, and their buffers can also be protected

through setbacks and overlay districts (28), but wetland and watercourse regulations are most common. By studying three towns that have successfully adopted wetland and watercourse regulations, we hope to identify key lessons learned that can help other towns pursue similar actions.

The following sections present the towns, their laws (p.9), the potential for widespread adoption of similar laws to assist with floodplain management (p.14), and lessons learned about adopting (p.17) and enforcing (p.22) wetland and watercourse regulations.

The Towns

Local land use regulations are difficult to adopt and enforce for a variety of reasons, and the technical complexities involved in identifying wetlands and intermittent watercourses may pose particular challenges to local governments. We studied three New York towns that had successfully adopted wetland and watercourse regulations to understand the challenges they faced in adopting these laws, how they overcame those challenges, and what challenges they continue to face with regards to enforcement and implementation.

To consider a wide range of contexts, we chose towns that all contain wetlands and that had all managed to pass local wetland and watercourse regulations but that were otherwise different from one another: in three different counties with three different demographic, geographic, and economic profiles (see Figure 1 and Table 1; see (29) for the rationale behind this selection strategy). The towns also vary in their proximity to New York City, which we expected to result in different levels of pressure to develop new housing and therefore different levels of resistance to adopting wetland and watercourse and other land use, floodplain management, and environmental regulations.

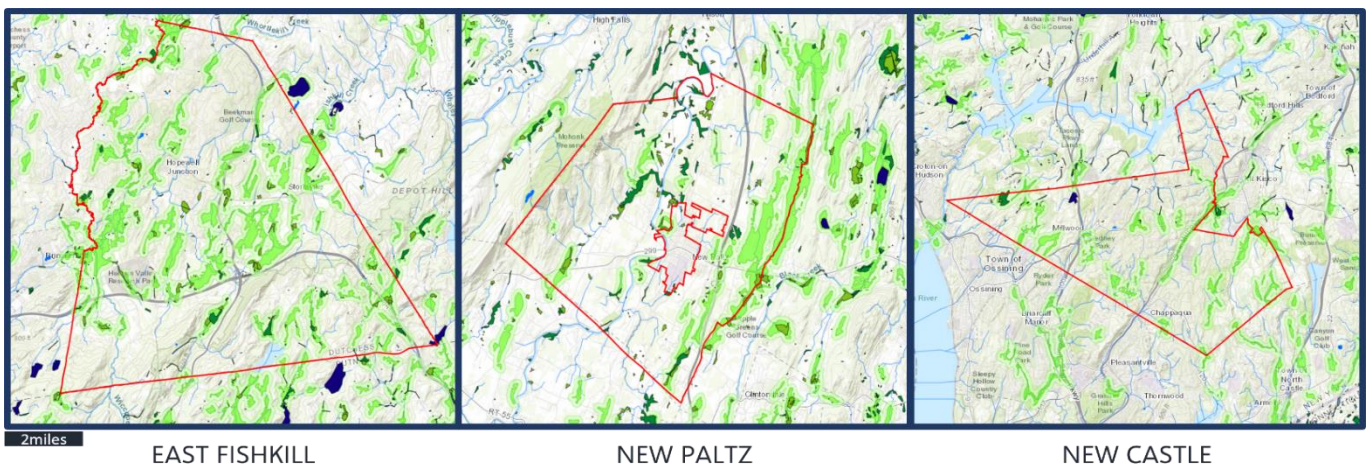
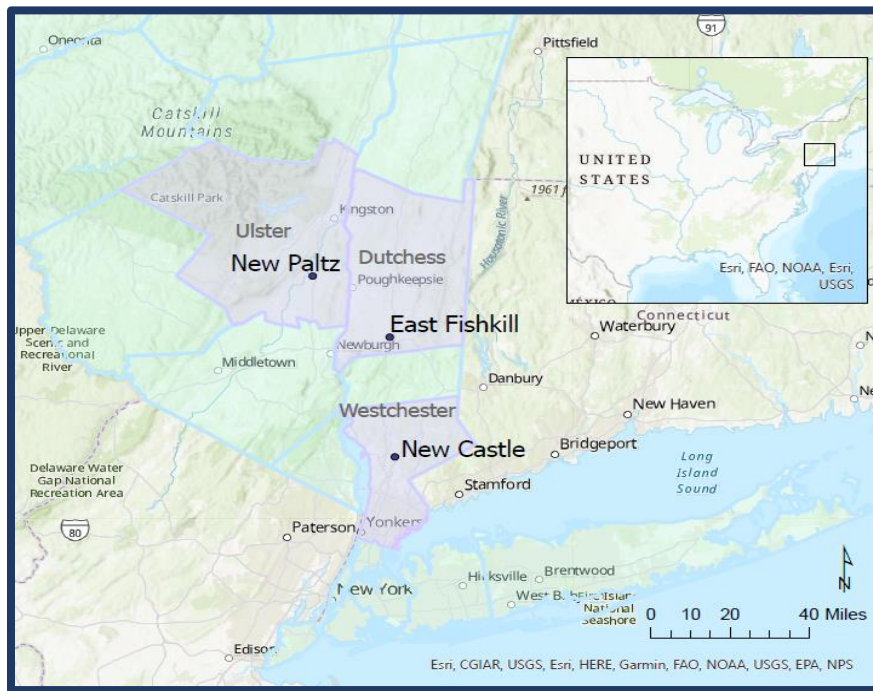


Figure 1. Top: East Fishkill, Dutchess County; New Paltz, Ulster, County; and New Castle, Westchester County, NY. Counties shaded purple. Bottom: State-regulated wetlands (light green), National Wetlands Inventory (dark green), and watercourses (blue). All to same scale. Source: NYS Environmental Resource Mapper: gisservices.dec.ny.gov/gis/erm.

	Population	Median household income	Median home value	Occupancy rates	Population density (per square mile)
East Fishkill	29,527	\$113,087	\$358,700	90.9%	513.8
<i>Dutchess County</i>	<i>294,218</i>	<i>\$81,219</i>	<i>\$282,000</i>	<i>68.8%</i>	<i>373.9</i>
New Paltz	14,036	\$76,335	\$314,900	55.9%	413.4
<i>Ulster County</i>	<i>177,573</i>	<i>\$64,304</i>	<i>\$230,500</i>	<i>68.3%</i>	<i>162.3</i>
New Castle	17,801	\$247,090	\$897,900	93.2%	756.1
<i>Westchester County</i>	<i>967,506</i>	<i>\$96,610</i>	<i>\$540,600</i>	<i>61.4%</i>	<i>2,204.7</i>

Table 1. Demographics and traits of three New York towns with wetland regulations. Source: U.S. Census

East Fishkill

East Fishkill is a town of just under 30,000 residents located in Dutchess County. It was originally part of a larger settlement, along with the Town of Fishkill, until East Fishkill separated in 1849. Today the town encompasses approximately 52 square miles and comprises 6 hamlets (Arthursburg, Fishkill Plains, Gayhead, Hopewell Junction, Peckslip and Stormville) and several neighborhoods. Most of the town is drained by Fishkill Creek, a tributary of the Hudson River, and its tributaries (30). The town's "rolling topography" varies from the Croton River watershed in the southeast to steep hills of the Hudson Highlands. The town's commercial hub is in Hopewell Junction, although the company National Resources has been developing a new area, called iPark, for tech, retail, and hotel businesses (37). Agriculture persists in the region but is not a major economic driver (30). The town has been described as "[a] 'family-oriented' bedroom community" that "attracts young professionals looking for a central location and a tranquil setting" (37).

East Fishkill is classified as a Class 8 community in the National Flood Insurance Program (NFIP) Community Rating System (CRS) (where communities ranked 9 have done the least flood mitigation and communities ranked 1 have done the most), so NFIP policyholders receive a 10% discount. The town adopted a Hazard Mitigation Plan in 2013 that includes wetlands protection as a main goal.

The town adopted its wetlands, water bodies, and watercourses law in 2007 (Local Law No. 8-2007). According to practitioners, an attorney who was working in Westchester County, where wetland regulations are more common, advocated for the adoption of the law in East Fishkill. The Westchester County Soil and Water Conservation District had published a model ordinance for wetland protection (first in 1988 and later updated 1998) (32), and this model and the attorney's experience in Westchester informed the East Fishkill regulation.



Village of New Paltz, NY. Daniel Case CC-by-SA 3.0

New Paltz

New Paltz was founded in 1677 and today is a town of 14,000 residents in Ulster County. As the town grew, Gardiner, Lloyd, Rosendale, and Esopus split from New Paltz to form their own towns. The current town encompasses 34 square miles and contains the Village of New Paltz, which is a separate governance entity. The Wallkill River flows north through New Paltz to join the Rondout Creek, which is a tributary of the Hudson River. The town's topography ranges from the Swarte Kill Wetlands in the north to the Shawangunk Ridge, part of the Appalachian Mountains. The New York Times describes the town as "beautiful, sporty, and cultured... surrounded by nature preserves and anchored by a state university," the State University of New York at New Paltz (33). Nature-based recreation and tourism are central to the town's economy.

The Town of New Paltz has a local emergency planning committee that monitors the community's preparedness. A "Climate Smart Communities Task Force" encourages climate-safe practices vis-a-vis "land use plans, zoning and building codes, and efficient transportation policies." Goal 7 of the Task Force is to "enhance community resilience and prepare for the effects of climate change," and they specifically reference adopting local adaptation plans. The Task Force has found that increased

precipitation and flooding pose the greatest future threat to the town: flood modeling estimates there will be a 12% increase in the number of buildings affected by flooding from 2041-2060. In 2020, the Environmental Conservation Board proposed to designate specific areas in the Town as Critical Environmental Areas (CEA), including the Plutarch Woods and Wetlands and the Swarte Kill Wetlands (34).

New Paltz first adopted a wetland and watercourse regulation in 2005, but this was annulled by the New York Supreme Court due to procedural problems (see *Legal Challenges to the New Paltz Wetland and Watercourse Regulation* on p.13). A new regulation was adopted in 2011, challenged in the courts, and finally entered into force in 2014. The 2011 wetland and watercourse regulation was adopted under the Municipal Home Rule authority for local governments (rather than the statutory authority of the NY Freshwater Wetlands Law) (see the Westchester Model Ordinance for a discussion on the different authorities available to local governments pursuing wetland and watercourse regulations).

According to practitioners in the town, two local leaders spearheaded the efforts to adopt a wetland and watercourse buffer regulation, but they received significant support from residents. Residents who were also ecologists and engineers were a “vital part of getting the scientific data together that were the backbones of the reason we needed a wetlands law” (Interview).

Several factors motivated the town to adopt local wetland and watercourse regulations. A few years before the first regulation was adopted, a proposal was made to develop the Mill Brook Greenway (337 acres of open space in the Village of New Paltz), which had served as an unofficial town park, and this raised awareness about the recreational value of wetlands and the need to protect them (35). High pollution levels in the Wallkill River also raised awareness: “telling people not to swim in the river was eye-opening”

(Interview). The Town has historically been proud of the Wallkill River, which is unusual for its northward flow. A documentary, titled “[Liquidity: The Value of Wetlands](#),” created by Jeanne Vitale, helped educate the town and region about the services wetlands can provide if they are protected. Changes to federal wetland governance raised concerns among local officials and prompted a desire for greater local control (see also 36).

New Castle

The town of New Castle, in Westchester County, was settled by families moving north from Manhattan in the 1600s, but it was officially founded in 1791 when it split from the town of North Castle (37). In the 1800s, the agricultural economy was slowly replaced by industry and elite estates, until the 1900s when the town became primarily a bedroom community for residents seeking homes at a convenient distance from New York City. As one historian describes New Castle:

“Since the early years of the 20th century, it has been one of the most affluent and attractive of tens of thousands of the nation’s suburbs. Its school system is consistently ranked among the top secondary institutions in the country, and its per capita income has long been far above the national average. Until recently, its quiet roadways were almost devoid of apartments of any kind, and its average home prices were among the highest in the continent” (37).

New Castle had a population of just 2,500 at the end of the 19th century. This rose to 14,000 in the 1960s, when the town saw rapid growth, and since to 17,000 (despite the loss of 5,000 residents when Mount Kisco became a separate town in 1979). The cost of living in New Castle is almost twice the U.S. average. The 2017 Town Comprehensive Plan notes that “it remains vitally important to maintain the Town’s bucolic character.”

The town is close enough to the coast to experience coastal storms and was damaged by Hurricanes Floyd (1999), Irene (2011), and Sandy (2012). New Castle was without power for more than a week after Hurricane Sandy (2012) and protective dikes north and south of the town were damaged. The town adopted a new Hazard Mitigation Plan in 2021 (FEMA-approved).

New Castle adopted a wetland and watercourse regulation in 1979 (Local Law No. 4-1979), the same year the case *Berenson v. New Castle* (415 N.Y.S.2d 669) invalidated New Castle zoning laws that excluded multifamily housing. In 1981, a resident challenged the wetland and watercourse regulation (when they were denied a permit to build a tennis court), on the basis that New Castle had provided no map of the regulated wetlands. The NY Court of Appeals, however, held that no map of locally regulated wetlands was required (*Drexler v. Town of New Castle*, 62 N.Y.2d 413). In the New Paltz case, the court considered whether a map was necessary to alert property owners that their lands and actions may be regulated (see p.13). In this case, property owners were aware of both the regulation and the presence of wetlands on their property, so the court only had to decide whether the NY Freshwater Wetlands Law required local governments to file a map of locally regulated wetlands; it held the statute did not.

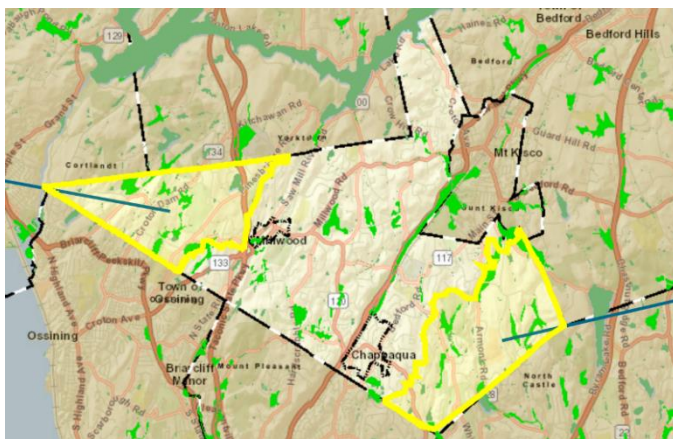


Figure 2. New Castle Environmental Protection Overlay Districts (Yellow). NYSDEC wetlands and National Wetland Inventory wetlands (Green) (axisgis.com/new_castleny).

The New Castle wetland and watercourse regulation was updated in 1990 (Local Law No 34-1990). The town also adopted an Environmental Protection Overlay regulation in 2002 that provides additional protections for wetlands in specially designated areas at the eastern and western ends of town; the law says these areas were chosen because of their lower development and numerous wetlands (Local Law No. 5-2002) (see Figure 2).

Gardiner

Gardiner is a town of 5,700 residents in Ulster County. Its 2008 Zoning Law contains a wetland and watercourse section (Article VII, §220-35). Anyone applying for a wetlands permit from federal or state agencies must notify the town Planning Board and anyone applying to the town for a permit must show the location and classification of all NYSDEC-regulated watercourses and wetlands on the parcel. Within a 150-foot buffer around NYSDEC-protected watercourses, projects must not cause erosion or stream pollution from runoff or cover more than 2% of the buffer in impervious surface. The Planning Board will ensure that the buffer is “adequate[ly] vegetated” and “maintain[s] existing tree canopy” over the stream and bank. Gardiner also requires a 100-foot setback for buildings, septic systems, driveways, fill areas, herbicide and fertilizer application, and vegetation removal.

Despite these protections, the law does not extend Gardiner’s authority to any smaller wetlands or watercourses than those regulated by NYSDEC. The law has therefore been described as “rudimentary” (Interview), and for the last decade, the town has been trying to adopt a more comprehensive regulation. In 2011, the Hudson River Estuary Program awarded the town a grant to draft a regulation (38), but the drafted regulation was rejected. Efforts to revise and revisit the regulation are ongoing. We spoke with practitioners to understand what barriers the town has encountered. Lessons learned are identified in the section on drivers of adoption (p.17).

Wetland and Watercourse Laws

The Environmental Law Institute (ELI) guide to buffer regulations (26) recommends that any local wetland and watercourse regulation include:

- (a) the purpose of the ordinance,
- (b) the wetlands and watercourses covered,
- (c) a definition of the buffer,
- (d) a list of activities permitted or prohibited,
- (e) procedures for review, and
- (f) details on monitoring and enforcement.

Table 2 summarizes these elements for the watercourse and wetland regulations in East Fishkill, New Paltz, and New Castle. Appendix B provides a more detailed summary of each provision.

Purpose

All three towns included language in the “purpose” and “findings” sections of their laws that reference the value of wetlands and watercourses and the need to protect them against degradation and destruction. Each lists a slightly different set of values. Notably, the “findings” section of each law mainly focuses on the value of wetlands. For example, both New Castle and New Paltz reference the fact that wetlands provide “visual relief” from development. This language is found in the Westchester model ordinance, so it is perhaps more surprising that East Fishkill does not contain this language (32). New Paltz further adds that wetlands provide a “sense of connection with the natural world,” highlighting how important that connection is to the town. New Paltz specifically notes the benefits provided by wetland buffers. New Castle and East Fishkill contain almost exactly the same language about rapid population growth encroaching on wetlands, which may have occurred if the Westchester attorney who advised on the drafting of the East Fishkill regulation used that language as a template. Notably, the Westchester model ordinance makes no mention of population

growth, so all three towns chose to or were advised to add language about the role of development in destroying wetlands (see 32).

The value of watercourses is less emphasized in the purpose and findings of these laws. New Paltz provides the most direct language on watercourses when it notes that “unnecessary interference with or defilement and disturbance” can increase erosion and floods and decrease water quality, aquatic habitat, and water availability.

Definitions

Watercourses

East Fishkill provides the most comprehensive definition of watercourses in its simple regulation: “Any identifiable channel through which water flows continuously or intermittently.” Intermittently is defined for water bodies as meaning water must stand or flow for at least three months of the year. New Castle defines waterbodies and watercourses to include “any natural or artificial” body or segment of water, whether permanent or intermittent, though the law does not go on to define what level of intermittency is permitted. New Paltz similarly defines waterbodies and watercourses to include both permanent and intermittent flows (using the same 3 months in a year minimum), but New Paltz explicitly excludes artificial water channels and waterways created to serve a stormwater function (e.g., drainage ditches and swales) from its regulation.

None of these regulations address ephemeral streams – those which flow only following precipitation. Ephemeral streams were once protected by federal law, but their federal protection was removed by the narrower definition of the ‘waters of the United States’ that was issued in 2019 (78). It is possible that New Castle’s law could be interpreted to apply to ephemeral streams, since it does not define intermittency, but the New Paltz and East Fishkill regulations expressly do not cover ephemeral streams.

Wetlands

Three common scientific criteria for identifying wetlands are hydrology, soil, and vegetation. New Paltz relies on the method for identifying wetlands set forth in the 1987 Federal Wetlands Delineation Manual (USACE), which required the presence of all three criteria (hydrology, soil, and vegetation). New Castle and East Fishkill reference the 1989 Interagency Manual, which allowed two criteria to be sufficient in some cases, making it more inclusive (39). Notably, the 1989 Interagency Manual was withdrawn by Congress in 1991 (40). Federal projects have therefore reverted to using the 1987 Manual but local governments may choose how to define their locally-managed wetlands. New Paltz's definition is therefore less inclusive than New Castle or East Fishkill, but it is aligned with USACE and NYSDEC definitions, which may have advantages for implementation.

Recognizing that it is difficult for a lay person to identify wetlands, any resident in New Paltz may request an inspection of their property at the town's expense (once per parcel). Identifying vernal pools may be particularly challenging, since their use as habitat can only be verified in the spring (see the inset on how New Paltz defined quality vernal pools – also see p. 13 for a discussion of legal challenges to that definition). In some cases, the need to inspect potential vernal pools in the spring, or to determine whether a stream has water for three months in a twelve-month period, could take time and cause delays for permitting a project.

In addition to its wetland and watercourse regulation, New Castle adopted an Environmental Protection Overlay in 2002 that provides additional protections for wetlands in specially designated areas at the eastern and western ends of town (Local Law No. 5-2002) (see Figure 2). In these areas, wetlands and waterbodies of any size are protected, the buffer is 150 feet (rather than 100 feet), and the town may request developers to engage in restoration activities at a 2:1 ratio (see Appendix B).

Regulated Activities

All three laws cover a similar set of regulated activities such as: draining, dredging, pollution (sewage), altering water flow, and clear cutting. Towns may readily tailor a wetland and watercourse regulation to fit their local needs by adjusting the regulated activities. For example, East Fishkill prohibits application of herbicides or pesticides. According to Town Board meeting minutes, New Paltz considered such a provision but decided the scientific evidence suggested such a regulation was not necessary. New Castle regulates animal grazing, and explicitly notes that this includes horses but not animals “producing agricultural products.” The inclusion of horses seems to be a nod to the prevalence of horse owners in New Castle. New Paltz included a provision that allowed regulation of “any other activity that is determined by the wetlands inspector... to have the potential for substantial adverse effects on the regulated areas.” This provision was challenged in *Gabrielli v. New Paltz*, but the Appellate Division found that it was not impermissibly broad (see p. 13).

New Castle and East Fishkill both grandfather existing uses in, but only insofar as those prior uses had a permit. New Paltz has the broadest exemptions that include recreation and agriculture as well as pre-existing actions and uses. Agriculture is a common exception in New York because New York State law specifically limits the authority of municipalities to adopt or enforce regulations that affect agriculture: local governments “shall not unreasonably restrict or regulate farm operations *within agricultural districts* ... unless it can be shown that the public health or safety is threatened” (Agriculture and Markets Law, Article 25-AA, §305-a; emphasis added). New Castle contains no designated agricultural districts, while there are numerous agricultural zones within both East Fishkill and New Paltz (see Figure 3). The county designates agricultural districts, and the Department of Agriculture and Markets (NYS DAM) reviews local

laws to determine whether they unreasonably limit agriculture.

In their *Guidelines for Review of Local Laws Affecting Farm Operations' Use of Wetlands*, NYSDAM notes that "In many instances, the Department has found local laws that exceed State standards unreasonably restrictive" (47). The NYSDEC does not regulate "the activities of farmers and other landowners in grazing and watering livestock, making reasonable use of water resources, harvesting natural products of the wetlands, selectively cutting timber, draining land or wetlands for growing agricultural products," clear-cutting vegetation other than trees, constructing winter roads for removing trees, operating motor vehicles for agricultural purposes, and using chemicals and fertilizers (47) (see ECL §24-0701(4) and §664.2(c) of the NYSDEC regulations). The New York Court of Appeals has held that wetlands smaller than 12.4 acres are subject only to local regulations, but NYSDAM nevertheless "takes into account wetlands standards established by the ECL and DEC regulations in evaluating whether local wetlands laws are unreasonably restrictive" (47).

Penalties

All three laws penalize violations of the wetland and watercourse regulations with fines, up to 15 days in jail, and civil penalties. New Paltz's provisions are the most severe, with civil penalties up to \$5,000 per day (each day is treated as a separate violation). East Fishkill's regulation is the least punitive, as it treats every *week* as a separate violation, rather than every day. The Westchester County model ordinance for wetland and watercourse regulations includes language that every day is a separate offense, so East Fishkill appears to have made a conscious decision to reduce the severity.

These penalties mainly provide an incentive for property owners to apply for permits when they undertake new activities on their land. An applicant for a permit for a new building or activity has an incentive to proceed with caution around wetlands and watercourses because the Planning Board (or other authorized board or official) may refuse to issue the permit or even issue a stop-work order, which can be very expensive for the developer, if they do not take the wetlands and watercourse law into account. New Paltz's law also includes language that could require a person in violation of the law to pay for wetland restoration. The New Castle Environmental Protection Overlay District Ordinance requires developers in those areas to pay for the replacement of wetlands at a 2:1 ratio.

Figure 3. NYDES Agricultural Districts mapped by Cornell University Geospatial Information Repository. Dutchess County (as of 2016), Ulster County (2015), Westchester County (2018). cugir.library.cornell.edu

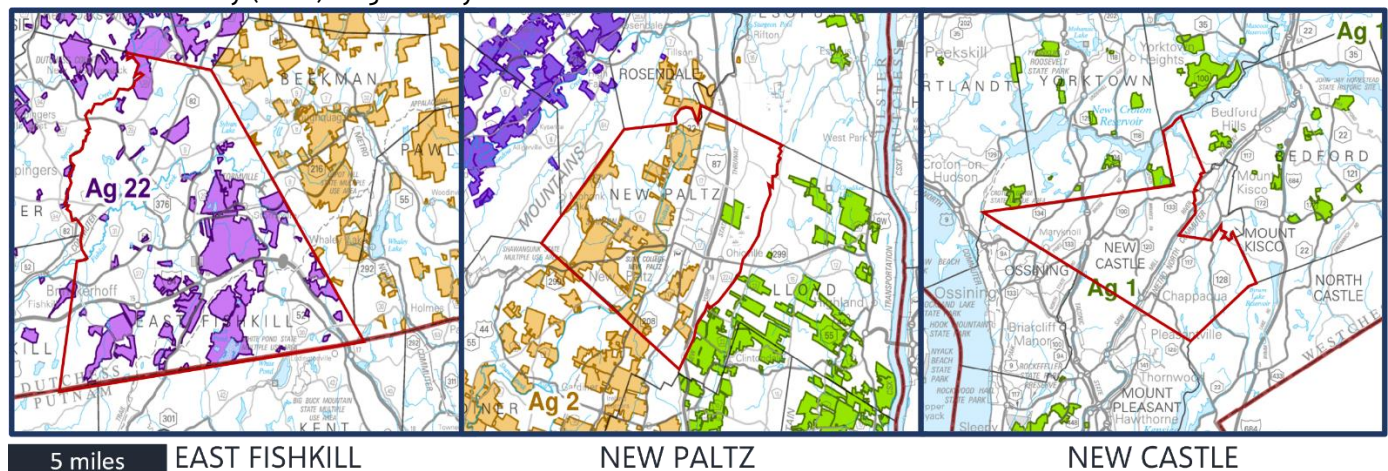


Table 2. Summary of wetland and watercourse regulations New Paltz, New Castle, and East Fishkill. See Appendix B for more details. Items of special note are italicized.

	New Paltz	New Castle	East Fishkill
Purpose	protect health, well-being, and property by preventing despoilation or destruction of wetlands and watercourses and buffer areas	preserve, protect, and conserve wetlands and watercourses ... consistent with the general welfare and beneficial economic and social development	a reasonable balance between the rights of the property owner and the right of present and future generations to enjoy wetlands and watercourses and their benefits
Wetland Benefits	improve water quantity and quality; reduce flooding and erosion; habitat and biodiversity; recreation; <i>"visual relief"</i> and <i>"sense of connection with the natural world"</i> ; educational space. Specifically notes buffers.	protecting water resources; reducing flooding and runoff; habitat and biodiversity; pollution control; <i>"visual relief from development"</i> ; educational spaces.	flooding and runoff, maintain groundwater supplies, water retention, recreational, natural beauty, and ecological function
Role of Develop.	population growth and economic and recreational activities make demands	Rapid population growth, attended by housing, road and other construction, harms wetlands and watercourses	Rapid population growth, attended by housing, road and other construction, harms wetlands and watercourses
Wetland definition	1987 Federal Wetlands Delineation	1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands	1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands
Watercourse definition	any natural, permanent, seasonal or intermittent water segment (at least 3 months of the year) but <i>not artificial channels</i>	any natural or artificial, permanent or intermittent, public or private surface water body or surface water segment	any identifiable channel through which water flows continuously or intermittently
Buffer	1/10 th – 1 acre: 50 ft 1+ acre: 100 ft Vernal pool: 100 ft Waterbody: Same as wetland Perennial watercourse: 100ft (except Wallkill River: 200ft) Intermittent stream: 50ft	100 ft <i>[150 ft for wetlands in Env Protection Overlay areas]</i>	½-1 acre: min 50 ft 1-2 acre: 50-100 ft 2-3 acre: 75-100ft 3+ acre: 100ft Watercourse: 50ft *Within range, buffer determined by planning board
Enforcement	permit; evaluated by Planning Board with input from Wetlands Inspector and Environmental Council Board; Building and Wetlands Inspector enforce	permit; evaluated by Planning Board, Environmental Review Board; Town Engineer, Building Inspector, and Environmental Coordinator issue tickets	permit; evaluated by Zoning, Planning, or Town Board with advice of Environmental Advisory Board
Penalties	Civil penalty (<\$5,000), fine, and possible days in jail; Each day separate violation	Civil penalty (<\$3,000), fine, and possible days in jail; Each day separate violation	Civil penalty (<\$3,000), fine, and possible days in jail; Each <i>week</i> separate violation

Legal Challenges to the New Paltz Wetland and Watercourse Regulation

New Paltz first adopted a wetland and watercourse regulation in 2005. That law was annulled in 2007 because town officials had failed to file the law with the Ulster County Planning Board, as required by NY General Municipal Law (§ 239-m).

In 2011, the New Paltz Town Board enacted a new wetland and watercourse law (Local Law No. 5) and several of the residents who had petitioned against the 2005 law again sued. Petitioners included property owners and the president of a land investment and development firm (42). The Supreme Court (Elliott III, J.) annulled the law based a decision that (a) the Town Board had failed to comply with the New York State Environmental Quality Review Act (SEQRA) (ECL Article 8) and (b) the law was unconstitutionally vague because it “did not identify what properties in the town are subject to the law’s restrictions” and therefore “places the burden on the property owner to determine if his or her property lies in a wetland designation area” (quoted in Townshend, 2012). However, the Appellate Division reversed this decision in 2014 (*Gabrielli v. New Paltz*, 116 A.D.3d 1315; 984 N.Y.S.2d 468 [2014]).

SEQRA REQUIREMENTS

The Town Board determined that the new law would not have an adverse effect on the town or its environment (after properly following procedures to give itself the authority to make such determinations). The Supreme Court held that the Town Board could not have reasonably made such a determination without knowing exactly which wetlands and which parcels would be regulated. However, the Appellate court determined that an exact map was not necessary because it would have been prohibitively difficult and expensive to obtain and the Town Board used reasonable sources given the alternatives available.

- The Appellate Court noted that although “‘strict compliance with SEQRA is required’, it is also true that ‘an agency’s obligation under SEQRA must be viewed in light of a rule of reason, realizing that not every conceivable environmental impact, mitigating

measure or alternative must be identified and addressed before the substantive dictates of SEQRA are satisfied’” (citations omitted).

- The court found that compiling maps of all known wetlands in the area was a sufficient source of information for the Town Board to have made an informed decision about whether the law would have significant environmental impacts.
- The court considered “the methodology employed in preparing the Town maps, the expense and impracticality of alternate methods... and the availability of Town-financed property inspections” when making this decision.

UNCONSTITUTIONAL VAGUENESS

The Appellate court noted that a law is only unconstitutionally vague if it does not provide “a person of ordinary intellect reasonable notice of the proscribed conduct” (internal quotation marks and citations omitted).

- The Appellate court found that the detailed description of the quality vernal pools provided in the 2011 law was “sufficient to permit persons of ordinary intelligence to make a preliminary assessment as to whether a natural feature that might be a QVP [quality vernal pools] is present on their land; the inspection mechanism is then available to provide a final determination. We find these provisions sufficient to provide the requisite reasonable notice.” (See Appendix B for full definition of quality vernal pools in the New Paltz law.)
- Riverkeepers and Pace Environmental Law Clinic noted, in their *amicus curiae* brief, that the New Paltz law was unusual in that it included a provision whereby property owners could request a wetlands inspection, at the town’s expense, to determine whether any regulated wetlands were located on the property (27). The Appellate Court does not state that this inspection mechanism is the sole or deciding factor in their conclusion that the New Paltz law is acceptable, but it does feature in their analysis. It is not clear whether future wetlands laws, if challenged on this point, will be expected to provide similar inspections at no cost to the property owner.

***This analysis does not, and is not intended to, constitute legal advice; the intent is to provide information for general information purposes only.*

Potential Effect on Floodplain Regulation

A municipality that is able to regulate flood-prone land could prevent new development from being placed too close to wetlands or watercourses, thereby limiting future risk, or inform the means of development (e.g., elevated or with permeable surface requirements), and could prevent or limit activities that harm wetlands, watercourses, and floodplains and reduce their ability to guide or absorb stormwaters and provide other benefits.

By comparing how much additional flood-prone land would be regulated if all New York municipalities adopted progressive wetland and watercourse laws, we can estimate how much flood management benefit these laws could provide (Tables 3-5). The percent of flood-prone land regulated by New York State wetland protections and buffers (column “NYSDEC Wetlands Regulations”) is compared to the percent of land that would be regulated in each town if that town adopted a wetland and watercourse law similar to those adopted by East Fishkill, Dutchess County; New Paltz, Ulster County; and New Castle, Westchester County (e.g., column “East Fishkill-style Regulation”).

Floodplains are assessed as both the Federal Emergency Management Agency (FEMA) 100-year floodplain (the 1% annual chance floodplain) and, because FEMA flood maps often under-estimate the amount of land that is exposed to floods, as a combined-floodplain: an area that includes both the FEMA 100-year floodplain and areas shown in flood models to be prone to a 1% annual flood (see Appendix A for details). The amount of regulated land is calculated by identifying mapped wetlands (using federal, state, and local sources) and watercourses (using federal and local sources) and applying the buffer from each regulation as appropriate. The two layers – flood-prone lands and regulated lands – are then compared. Local

regulations often address wetlands that are not mapped (e.g., vernal pools), so this analysis underestimates the potential for local regulations to overlap with floodplains. It is intended as a conservative estimate.

In Dutchess County, adoption of an East Fishkill-style wetland and watercourse buffer (if enforced at its maximum range) would increase the amount of regulated floodplain by 40% (Table 3). This would include an average of 71% of the FEMA floodplain (up from 32% by state regulations alone) and 70% of the combined floodplain (up from 30%). The Town of Fishkill, Poughkeepsie City, and Wappingers Falls Village would increase the amount of regulated flood-prone land by more than 60%. The Town of Red Hook would be able to regulate 90% of the FEMA-designated 100-year floodplain. East Fishkill increased its ability to regulate the floodplain by 20% (19.5% FEMA, 21.2% combined).

In Ulster County, adoption of a New Paltz-style wetland and watercourse buffer law would increase the average amount of regulated floodplain – either FEMA or combined – by 57% (Table 4). The floodplain in every municipality would be at least 50% regulated, with the greatest gains in places like Marlborough (5% regulated under state law to 98% regulated under a New Paltz-style regulation), Hurley (4% to 85%), Olive (5% to 82%), Esopus (21% to 92%) and Kingston (4.5% to 73%). The Town of New Paltz increased regulation of its floodplain 40% to include 63.6% of FEMA floodplains and 68% of combined floodplains.

In Westchester County, adoption of a New Castle-style wetland and watercourse buffer law would increase the amount of FEMA regulated floodplain by an average of 59% (71% for combined floodplains) (Table 5). Municipalities would be able to regulate 40-100% of their floodplains. The Town of Rye would be able to regulate 100% of its FEMA-designated floodplain. New Castle increased its ability to regulate floodplains from 40% to 96% (96.2% of combined floodplains and 97% of FEMA-designated floodplains).

Note: the combined floodplain (blue shade) includes more land than the FEMA-designated 100-year floodplain (grey shade) because the combined floodplain considers multiple flood models (see text and Appendix A for more details).

Table 3. Regulated Floodplain Changes in Dutchess County

Municipality	% Floodplain (Combined Sources)			% Floodplain (FEMA 100-yr)		
	NYSDEC Wetlands Regulation	East Fishkill-style Regulation (max. buffer)	Change NYSDEC-EF	NYSDEC Wetlands Regulation	East Fishkill-style Regulation (max. buffer)	Change NYSDEC-EF
Amenia, Town	35.4%	77.1%	41.6%	26.9%	76.0%	49.1%
Beacon, City	9.2%	68.2%	59.0%	10.6%	73.4%	62.7%
Beekman, Town	23.0%	61.7%	38.7%	21.1%	57.2%	36.1%
Clinton, Town	41.1%	76.3%	35.3%	43.9%	80.0%	36.2%
Dover, Town	38.4%	74.1%	35.7%	44.6%	73.4%	28.8%
East Fishkill, Town	51.9%	73.1%	21.2%	54.0%	73.5%	19.5%
Fishkill, Town	11.1%	80.9%	69.7%	11.2%	83.4%	72.2%
Fishkill, Village	0.0%	29.5%	29.5%	0.0%	28.3%	28.3%
Hyde Park, Town	20.4%	77.7%	57.3%	20.0%	82.4%	62.4%
La Grange, Town	31.6%	60.2%	28.6%	31.8%	61.5%	29.7%
Milan, Town	34.1%	74.5%	40.5%	52.8%	77.0%	24.2%
Millbrook, Village	29.9%	56.0%	26.1%	33.1%	61.6%	28.5%
Millerton, Village	40.0%	61.1%	21.2%	26.4%	54.6%	28.2%
North East, Town	47.6%	80.7%	33.1%	57.8%	86.3%	28.5%
Pawling, Town	46.2%	80.8%	34.6%	57.2%	86.1%	28.9%
Pawling, Village	56.7%	70.8%	14.1%	59.4%	74.2%	14.8%
Pine Plains, Town	41.0%	75.8%	34.8%	52.3%	77.5%	25.2%
Pleasant Valley, Town	28.8%	66.8%	38.0%	24.8%	65.0%	40.2%
Poughkeepsie, City	2.6%	65.5%	62.9%	2.5%	68.5%	66.0%
Poughkeepsie, Town	12.3%	66.4%	54.1%	12.3%	67.5%	55.2%
Red Hook, Town	33.4%	83.0%	49.6%	29.4%	85.9%	56.5%
Red Hook, Village	84.1%	93.7%	9.6%	86.1%	90.4%	4.3%
Rhinebeck, Town	22.6%	80.0%	57.4%	19.5%	85.6%	66.1%
Rhinebeck, Village	8.9%	53.7%	44.8%	10.7%	56.7%	46.0%
Stanford, Town	33.9%	76.3%	42.4%	44.3%	80.9%	36.7%
Tivoli, Village	13.3%	58.9%	45.6%	17.4%	58.4%	41.1%
Union Vale, Town	35.6%	68.3%	32.7%	43.1%	72.7%	29.6%
Wappinger, Town	22.7%	67.4%	44.7%	18.6%	66.7%	48.1%
Wappingers Falls, Village	0.1%	64.4%	64.3%	0.1%	64.6%	64.5%
Washington, Town	40.2%	73.8%	33.6%	44.8%	74.7%	29.9%
AVERAGE	29.9%	69.9%	40.0%	31.9%	71.5%	39.6%
STD DEVIATION	18.5%	11.8%	14.8%	20.9%	12.9%	17.3%

Table 4. Regulated Floodplain Changes in Ulster County

Municipality	% Floodplain (Combined Sources)			% Floodplain (FEMA 100-yr)		
	NYSDEC Wetlands Regulation	New Paltz-style Regulation	Change NYSDEC-NP	NYSDEC Wetlands Regulation	New Paltz-style Regulation	Change NYSDEC-NP
Denning	1.1%	60.3%	59.2%	0.4%	60.7%	60.3%
Ellenville, Village	0.0%	63.4%	63.4%	0.0%	50.3%	50.3%
Esopus	23.4%	89.1%	65.6%	21.1%	92.1%	71.0%
Gardiner	11.7%	60.0%	48.4%	10.9%	56.2%	45.3%
Hardenburgh	1.0%	69.8%	68.8%	1.1%	59.8%	58.7%
Hurley	5.9%	83.5%	77.6%	4.3%	84.9%	80.6%
Kingston, City	4.3%	72.6%	68.2%	4.5%	72.8%	68.3%
Kingston, Town	10.4%	69.4%	59.0%	0.2%	60.1%	60.0%
Lloyd	42.4%	88.9%	46.5%	46.9%	90.8%	43.9%
Marbletown	16.2%	60.2%	43.9%	11.3%	50.2%	38.8%
Marlborough	18.9%	88.9%	70.0%	5.1%	98.0%	92.9%
New Paltz, Town	27.8%	68.1%	40.3%	23.3%	63.6%	40.4%
New Paltz, Village	7.9%	57.3%	49.4%	14.6%	62.3%	47.7%
Olive	6.4%	79.2%	72.8%	4.9%	82.4%	77.4%
Plattekill	58.6%	91.1%	32.4%	96.3%	98.8%	2.5%
Rochester	12.7%	57.5%	44.8%	11.2%	54.0%	42.8%
Rosendale	4.9%	69.5%	64.6%	2.7%	69.0%	66.3%
Saugerties, Town	8.9%	65.2%	56.3%	9.2%	73.9%	64.8%
Saugerties, Village	25.9%	87.2%	61.3%	27.1%	89.7%	62.5%
Shandaken	0.0%	67.4%	67.4%	0.0%	63.0%	63.0%
Shawangunk	16.7%	65.8%	49.2%	10.4%	62.0%	51.6%
Ulster	9.1%	61.2%	52.2%	7.0%	60.0%	53.1%
Wawarsing	19.9%	75.1%	55.2%	15.3%	75.3%	60.0%
Woodstock	7.3%	67.9%	60.6%	10.1%	62.1%	52.0%
AVERAGE	14.2%	71.6%	57.4%	14.1%	70.5%	56.4%
STD DEVIATION	13.9%	11.1%	11.3%	20.5%	15.1%	17.6%

Table 5. Regulated Floodplain Changes in Westchester County

Municipality	% Floodplain (Combined Sources)			% Floodplain (FEMA 100-yr)		
	NYSDEC Wetlands Regulation	New Castle-style Regulation	Change NYSDEC-NC	NYSDEC Wetlands Regulation	New Castle-style Regulation	Change NYSDEC-NC
Ardsley, Village	0.0%	75.3%	75.3%	0.0%	70.6%	70.6%
Bedford, Town	30.5%	94.7%	64.1%	28.1%	96.0%	67.9%
Briarcliff Manor, Village	57.6%	90.6%	33.0%	70.1%	88.9%	18.8%
Bronxville, Village	0.0%	75.8%	75.8%	0.0%	76.6%	76.6%
Buchanan, Village	10.9%	85.2%	74.3%	12.1%	86.1%	74.0%
Cortlandt, Town	13.3%	94.8%	81.6%	10.9%	96.4%	85.4%
Croton-on-Hudson, Village	3.6%	97.4%	93.8%	3.6%	97.8%	94.2%
Dobbs Ferry, Village	0.0%	86.5%	86.5%	0.0%	81.4%	81.4%
Eastchester, Town	7.6%	91.9%	84.3%	8.1%	95.2%	87.1%
Elmsford, Village	0.0%	47.6%	47.6%	0.0%	51.4%	51.4%
Greenburgh, Town	0.1%	94.9%	94.7%	0.0%	98.1%	98.1%
Harrison, Village	6.3%	83.8%	77.5%	7.6%	83.9%	76.3%
Hastings-on-Hudson, Village	0.0%	83.6%	83.6%	0.0%	83.4%	83.4%
Irvington, Village	0.0%	80.2%	80.2%	0.0%	82.9%	82.9%
Larchmont, Village	0.0%	43.7%	43.7%	0.0%	44.3%	44.3%
Lewisboro, Town	47.7%	96.6%	48.9%	32.6%	96.1%	63.5%
Mamaroneck, Town	0.0%	98.3%	98.3%	0.0%	98.4%	98.4%
Mamaroneck, Village	0.9%	58.5%	57.6%	0.9%	58.6%	57.8%
Mount Kisco, Village	51.2%	82.0%	30.9%	54.5%	83.1%	28.6%
Mount Pleasant, Town	5.6%	96.0%	90.3%	3.9%	97.2%	93.3%
Mount Vernon, City	0.0%	70.6%	70.6%	0.0%	70.1%	70.1%
New Castle, Town	39.8%	96.2%	56.3%	42.9%	97.0%	54.1%
New Rochelle, City	0.9%	89.0%	88.1%	0.9%	89.6%	88.7%
North Castle, Town	24.1%	93.8%	69.7%	20.7%	93.9%	73.2%
North Salem, Town	32.2%	95.3%	63.1%	21.0%	94.7%	73.7%
Ossining, Town	0.4%	99.5%	99.1%	0.3%	99.9%	99.6%
Ossining, Village	0.0%	72.1%	72.1%	0.0%	73.8%	73.8%
Peekskill, City	1.5%	89.9%	88.4%	1.3%	91.5%	90.2%
Pelham Manor, Village	0.0%	43.0%	43.0%	0.0%	42.5%	42.5%
Pelham, Village	0.0%	67.2%	67.2%	0.0%	70.7%	70.7%
Pleasantville, Village	5.7%	87.1%	81.4%	7.4%	86.8%	79.4%
Port Chester, Village	0.0%	48.2%	48.2%	0.0%	48.2%	48.2%
Pound Ridge, Town	51.1%	95.2%	44.1%	57.1%	94.4%	37.3%
Rye Brook, Village	2.3%	74.4%	72.1%	2.8%	77.2%	74.4%
Rye, City	1.8%	86.2%	84.3%	1.8%	86.2%	84.4%
Rye, Town	0.0%	100.0%	100.0%	0.0%	100.0%	100.0%
Scarsdale, Village	0.1%	71.2%	71.1%	0.0%	66.2%	66.2%
Sleepy Hollow, Village	0.0%	74.0%	74.0%	0.0%	75.1%	75.1%
Somers, Town	28.6%	94.3%	65.7%	20.9%	94.1%	73.2%
Tarrytown, Village	12.9%	90.2%	77.3%	14.2%	86.5%	72.3%
Tuckahoe, Village	0.0%	62.4%	62.4%	0.0%	60.8%	60.8%
White Plains, City	3.2%	82.3%	79.1%	0.0%	84.0%	84.0%
Yonkers, City	0.0%	84.6%	84.6%	0.0%	84.8%	84.8%
Yorktown, Town	28.5%	92.0%	63.5%	28.1%	93.4%	65.3%
AVERAGE	10.6%	82.2%	71.5%	10.3%	61.6%	59.1%
STD DEVIATION	16.9%	15.6%	17.7%	17.4%	15.7%	18.8%

Enablers of adoption

Local environmental and land use regulation is often difficult, for a variety of reasons including: lack of expertise or leadership, scarce resources, competing political agendas, and institutional context (43). Key factors that enable communities to overcome these challenges and adopt wetland and watercourse regulations include:

- Leadership
- Science & Legal Expertise
- Environmental Education & Outreach
- Politics & Development

Leadership

In all three towns, one or more leaders – often members of local government but sometimes legal or scientific experts – championed the adoption of a wetland and watercourse regulation. Champions have been shown to be an important driver for organizations adopting a variety of environmental behaviors (44–46). Champions are often personally motivated by a love of nature and are willing to make personal sacrifices for environmental or community benefits (47). In the New York towns we studied, leaders played several roles. They raised awareness of the issues, contributed expertise or sought out experts who could support the initiative, and communicated effectively with the public and with other local officials. The ability to form and maintain personal relationships, even with opposing officials or town leaders, was important. Personality conflicts – often especially rife in local politics – can derail projects, so in some cases passing leadership of the cause to a new individual can help prevent a regulation from becoming too closely affiliated with one individual and their perceived agenda.

Environmental leaders can start the process, but adopting and implementing wetland and watercourse regulations will require widespread and long-term support (46). Leadership is important in building coalitions and motivating others to take on

leadership roles of their own. Building Inspectors, Wetland Inspectors, or other enforcing officials must determine whether a permit is required; the Planning Board or Zoning Board must decide how strictly to enforce the regulations each time it issues or rejects a permit. Individuals in the local government volunteer to complete annual reports (if they are not officially tasked) or to update maps or other routine compliance measures. Residents report violations and take steps to ensure they are compliant with the permitting process. The more people who see value in the wetland and watercourse law, and who are willing to support its adoption and enforcement, the more effective the law will be.

Science & Legal Expertise

Wetland and watercourse regulations rely on a wealth of scientific knowledge, so creating a wetland and watercourse regulation often requires significant scientific and legal expertise. For example, Hudsonia Ltd., an environmental research non-profit, assessed the type and location of critical habitats in East Fishkill (30) and the biodiversity and status of wetlands in the Mill Brook Greenway in New Paltz (35). As a non-advocacy organization, Hudsonia Ltd. did not advocate for wetland regulations. Rather, the scientific assessments they provided helped leaders to convince the public and other government officials that wetlands were worth protecting (see also reports by Biohabitats, Inc., explaining the value of buffers: 22, 23). After their first regulation was annulled, the Town of New Paltz asked their wetlands inspector to provide an analysis of quality vernal pools within the town, as a way of gaining greater scientific information for their second law.

Some local officials have significant legal expertise and are able to draft regulations on their own. New Castle, for example, adopted its wetland and watercourse law almost a decade before the Westchester County model wetland and watercourse ordinance was created. However, in many cases, the process is easier and faster when they can rely on

model ordinances or guidelines (26). According to practitioners in Westchester County, the existence of a model ordinance has helped local governments in that county to adopt regulations. By 1998, the authors of the model ordinance noted 16 municipalities within Westchester had incorporated elements of the model ordinance (32). Other counties, in New York and other states, have also used the Westchester model ordinance (22, 28). The inspiration for East Fishkill to adopt its wetland and watercourse regulation reportedly came from an attorney working in Westchester who was familiar with the model ordinance.

Of course, model ordinances are not the only source of expertise. Gardiner hired a consultant to draft a wetland and watercourse regulation, but because the regulation has not yet been adopted, some local officials view the consultant's work as a waste of time and money. Gardiner is now working with a volunteer expert to refine and simplify the proposed regulation.

Wetland scientists and legal experts may seek to add provisions (and thereby complication) to the regulation to make it more comprehensive or more technically correct. However, several practitioners told us that simpler laws, based on a minimum amount of science, may be easier to communicate to the public and to officials and therefore gain more support. In its 2019 Annual Review of its wetland and watercourse law, New Paltz officials noted that the plan is "lengthy and complex, consisting of 26 sections in 50 pages of code. This makes the complete and fully productive administration of this chapter a challenge for the Planning Board, its consultants, the EnCB [Environmental Conservation Board], and the public." Gardiner officials noted that complexity in their proposed law led to confusion and additional resistance. They hope a simpler version of the law might be easier to explain and therefore gain greater support.

Environmental Education & Outreach

One of the greatest barriers to adopting wetland and watercourse regulations is a lack of awareness about the benefits provided by wetlands, watercourses, and their buffers. Efforts to educate public officials and residents are therefore crucial. Environmental regulations are often seen (rightly or wrongly) as limiting development and infringing on individual property rights. These objections are particularly strong in places with high land values and limited housing stock that face incredible pressure to develop. Resistance also tends to be strong in areas where people support a limited role for government and therefore see any attempt to regulate the ways they use their real estate as overreach.

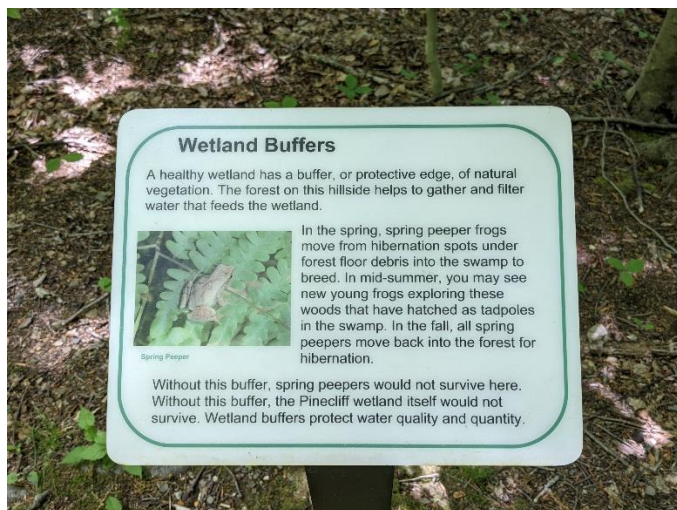
These barriers are reduced in places where people highly value open space and natural ecosystems. The Mill Brook Greenway in New Paltz was used as an informal town park long before it became an official park (renamed the Mill Brook Preserve) (35). Residents therefore had a specific, identifiable, and personal reason to want to protect wetlands from development. Towns where wetlands or watercourse buffers serve educational or recreational purposes may find it easier to explain the value of protecting these lands to their residents.



Mill Brook Preserve, New Paltz

Likely due to its location and nature-based tourism economy, New Paltz also has a strong culture of valuing ecosystems and species. At a vernal pool, one local official noted a strip of road where residents help frogs to safely cross the road during mating season. Charismatic animals, as with most environmental conservation efforts, can be useful in gaining public support – especially when the connection between the species and their habitat is clear (48). Beavers, for example, are common in New Paltz wetlands and are generally admired and loved by residents, which made it simpler to help people understand how protecting wetlands also protected these animals.

Wetlands that are already protected can be leveraged to further this educational outreach. The Pinecliff Sanctuary in New Castle, for example, contains numerous informational signs about wetlands and the values they provide. It even includes a sign specifically about the role buffers play in protecting healthy wetland ecosystems.



Informational sign in Pinecliff Sanctuary, New Castle.

Hazards may also motivate people to embrace the benefits provided by healthy wetlands and watercourses. Individuals and communities have different priorities in terms of the hazards that most concern them – e.g., some care more about floods and others more about water quality – so communication efforts should focus on the priorities

of the town. Visible hazards such as floods may gain more public support (e.g., more so than a depleting aquifer or slowly accumulating river pollution). Emphasizing the role wetlands, watercourses, and buffers play in addressing those hazards, however, appears to be an important factor in helping residents and officials to understand the need for regulations. Scientific reports may help, but asking residents to share their stories (e.g., to describe how a recent flood affected them) can also be a powerful communication tool.

Regulatory Fatigue

Regulations often serve overlapping purposes. For example, floodplain damage prevention regulations, zoning regulations, critical habitat areas or overlay zones, and wetland and watercourse regulations all serve distinct but related land use goals. In towns where one or more of these regulations have already been adopted, it may be hard to convince the town that at the marginal benefit of adopting yet another regulation outweighs the costs in enforcement and public good will. This is especially true if those related regulations have been adopted recently or if they sparked significant political controversy.

In New Paltz, for example, some residents and local officials have expressed opposition to a Critical Environmental Area designation because they either do not see the additional value it would provide (above and beyond the existing wetland and watercourse regulation) or because they are concerned about imposing additional costs (financial and personnel) on the local government and additional limits on development and private property rights. In East Fishkill, practitioners noted that many of the town's wetlands are already protected because they provide habitat for bog turtles, which are an endangered species. (The habitat protection provides a 300-foot buffer.)

Even explaining why local regulations are necessary, above and beyond federal or state regulations, may be difficult. For example, during

public meetings before the adoption of the New Paltz regulation, residents expressed opposition to additional regulations. One resident said, “The more rules and regulations we have, the more things get screwed up” (quoted in 49). Resident opposition to environmental regulations may be particularly strong when residents feel that their ability to use their land is being threatened. Practitioners described strong resistance to adopting wetland and watercourse regulations from the agricultural sector (both commercial and personal, i.e., raising horses) even though their regulations include exemptions for agricultural activities. A resident who challenged New Paltz’s law in court said that he opposed the law because of how it would affect residents: “I am disappointed for the property owners who don't yet realize the impact this will have on the resale value of their homes, and also for the parents who will be denied a playhouse for their children or even clearing the vegetation for a recreational area” (50). Swing sets, gardens, and pest control were common issues raised by residents in all three towns. During public meetings before the first New Paltz law was adopted, another resident expressed support for the bill: “Even though it will limit what I can do on my property, I will support it. Clean water is more important” (49). Her statement reflects the tension many residents expressed in wanting to balance their rights to use their property with their desire to have clean water, habitat, and other benefits provided by the regulation. The challenge for proponents is to help residents see why this regulation tips the scales.

For some residents, it will be important to explain the need for local regulation. One New Paltz resident explained her opposition to the wetland and watercourse law by noting that NYSDEC already regulates wetlands: NYSDEC “does a wonderful job. Let the state handle it” (quoted in 49). Local and state wetland and watercourse regulations are distinct, of course. They regulate different wetlands and different activities, depending on the wording of the local regulation.

Similarly, different types of regulations serve distinct purposes. East Fishkill, New Paltz, and New Castle all have Flood Damage Prevention regulations, for example, but these regulations focus on how buildings in the floodplain should be constructed (e.g., the elevation of the first floor), rather than on guiding the location of construction, as wetland and watercourse regulations do. Protecting critical habitat for one type of endangered species may not protect important habitat for other species (e.g., a wetlands law does not necessarily protect critical mountain habitat).

The difficulty for adopting any of these regulations lies in explaining these differences, and the need for multiple regulations, to local officials and the public. A proponent of a regulation may want to focus their communication efforts on the unique value added by the regulation (i.e., if a town already has a floodplain regulation, the proponent may want to emphasize how a wetland and watercourse regulation will improve water quality, rather than emphasize the flood mitigation value, and vice versa if the town already has a critical habitat regulation). Proponents may also want to consider the timing of their proposals or to pursue a more comprehensive approach in a single regulation that achieves multiple objectives rather than through the accumulation of multiple targeted regulations.



Photo: Bog Turtle, USFWS

Politics and Development

Town Boards and Planning Boards have numerous goals for the community: e.g., healthy

environments, thriving economies, adequate housing. Even though land use regulations can help towns pursue these goals, they may face resistance from economic sectors and housing authorities who fear regulations will limit the ability of the town to develop. Several practitioners noted that wetland and watercourse regulations in their towns had received significant resistance from developers and real estate agents.

We had expected that wetland and watercourse regulations would be more readily adopted in towns that faced less development pressure, because the regulations would face less opposition from developers and people proposing new construction. However, we found the reverse; extreme development pressure appears to enable or even drive adoption of wetland regulations. Indeed, this may partially explain why wetland regulations are more common near New York City (where development pressure is presumed to be highest) and less common farther west. Consider, for example, that 78% of Westchester County municipalities have adopted wetland and watercourse regulations (where property values and population densities are highest due to proximity to New York City), 54% of Dutchess County, and just 28% of Ulster County (with the lowest property values and population density of the three counties) (see Appendix C for information on which towns in these counties have adopted wetland and watercourse laws).

This raises a potential tension between land use regulation to protect environmental resources (and the flood risk mitigation benefits they provide) and development of housing, especially affordable housing (see, e.g., 51–53). The often-cited concern is that wetland regulations may (either intentionally or unintentionally) limit affordable housing and thereby exclude certain populations. For example, if every municipality in Dutchess County adopted an East Fishkill-style regulation, the amount of regulated land would increase by an average of 11% (see Appendix D). In towns like Fishkill, Hyde Park,

Red Hook, and the Town of Rhinebeck, an additional 28–33% of the town’s land would be subject to wetland regulations. In Ulster County, widespread adoption of a New Paltz-style regulation would increase regulated lands by an average of 16%. New Paltz itself increased regulated lands from 11% to 28%. The towns of Esopus, Hurley, Lloyd, Plattekill, and Saugerties would see up to 40% of their land area regulated. Westchester County municipalities would increase their regulated lands by 26% on average (see Appendix D for information on the percent of municipal land and buildings that would be potentially be affected by more stringent wetland and watercourse regulations).

Notably, even though a larger amount of land would be regulated, wetland and watercourse regulations like those in East Fishkill, New Paltz, and New Castle do not prohibit development on regulated lands. They require permits and additional scrutiny, but they do not prevent development outright. Practitioners describe cases in which a developer has built fewer homes on a parcel to avoid encroaching on a buffer, but only one case was described in which housing development could not occur because the entire parcel was inside the regulated buffer. Nor do wetland and watercourse regulations limit the density of housing upon a parcel: if a multi-family home can be built outside the buffer, wetland and watercourse regulations pose no opposition. In fact, building to limit encroachment on wetland and watercourse buffers may encourage denser development. Based on a review of town meeting minutes discussing wetland permits and violations, wetland and watercourse regulations are more likely to limit the ability of property owners to install a second garage, clear-cut part of a yard, or build a new tennis court than to limit affordable housing.

More generally, the academic research on the effect of wetland and watercourse regulations (or land use regulations generally) and housing supply and pricing does not necessarily support this concern. Some research supports the conclusion

that stricter land use regulation decreases new construction and raises housing prices. However, such studies have rarely been able to attribute reduced development directly to land use regulations and results have been mixed (54). In Massachusetts, for example, one analysis concludes that the adoption of local wetland regulations stricter than state law appears to reduce new construction by about 10% (55). Another study, also in Massachusetts, concludes that adoption of local wetland regulations has no significant impact on housing permitting, development, or pricing (57).

Nevertheless, towns adopting wetland regulations should be careful that their wetland and watercourse regulations do not exclude affordable housing development and are not perceived as intending to limit diverse types of housing.

Consider the case of New Castle, for example. The town's population grew significantly in the 1960s. In the 1970s, the environmental harm of rampant development began to be apparent, and "a no-growth philosophy took hold, with many residents actively opposing any new corporate or retailing development" (37). By the late 1970s, the town's zoning ordinance did not allow for the construction of multifamily housing. A developer sued, and in the landmark case *Berenson v. New Castle* (415 N.Y.S.2d 669; N.Y. App. Div. [1979]), the Appellate Court noted that New Castle must not only balance the current and future needs of its community but also consider the broader needs of the county and region (e.g., New York City residents searching for multi-family housing). Despite this history, New Castle continues to contain few multi-family units (56). In fact, the 2017 Comprehensive Plan notes the "careful and deliberate community planning" that has maintained the community's "bucolic neighborhoods," and proposes to continue this tradition. In interviews with us, practitioners suggested that New Castle (and other Westchester towns) may have adopted wetland and watercourse regulations as a means of indirectly limiting the density of new development. New Castle's wetland

regulation specifically notes that "rapid population growth, attended by housing, road and other construction" has contributed to the "encroaching upon, despoiling, polluting or eliminating" of wetlands. Whether intentional or not, the regulation has been perceived as a limit on development, and this may generate opposition to future environmental regulations.

East Fishkill and New Paltz lack this legal history and are less explicit about the need to limit development, but both towns mention population growth and the accompanying development as a threat to wetlands and watercourses that their regulations seek to address. This language within the regulations can create the appearance of a conflict between development and open space preservation even if one is not intended.

To be clear, we are not suggesting that any town has adopted wetland and watercourse regulations with the intent to prevent or limit affordable or multi-family housing or to exclude any populations. Nevertheless, multiple practitioners voiced the concern that wetland regulations may result in this outcome. Towns seeking to adopt wetland and watercourse regulations in the future should be prepared to address this concern. Identifying priority areas for growth and housing development within the community may help to allay residents' concerns about housing affordability.

Challenges for Implementation

To effect change, laws and regulations must be implemented and enforced. Wetland and watercourse regulations commonly require a person who intends to engage in a regulated activity to apply for a permit. New Castle's law, for example, says: "Any person proposing to conduct or cause to be conducted a regulated activity... upon any wetlands or wetlands buffer shall file an application for a permit" (137-5A). Enforcement of wetland and

watercourse regulations therefore involves both (a) reviewing permit applications and denying or suggesting modifications to these permits as necessary and (b) addressing individuals who have pursued regulated activities without applying for a permit.

Reviewing Permit Applications

Practitioners in East Fishkill, New Paltz, and New Castle, report that their town planning, zoning, and environmental boards (who review permit applications) have enforced the wetland and watercourse regulations. They note that board members routinely ask for more information about the wetlands onsite from applicants, recommend strategies to reduce the effect of activities or development on wetlands and watercourse buffers (e.g., by reducing the number or location of buildings onsite, adding natural vegetation, or altering plans for drainage). Practitioners generally agree that their Boards take the regulation seriously and do not issue variances. In East Fishkill, for example, where the regulation provides for different buffer distances depending on the size of the wetland, the town generally asks petitioners to meet the largest buffer (100 feet) and offers reduced buffers only if necessary. In New Paltz, officials describe the Planning Board as generally strict in enforcing the law. However, they note that the Planning Board may be reticent to require anything above and beyond the letter of the law (e.g., to request a larger buffer or to ask for other accommodations). This reticence may be due to the litigation that surrounded the adoption of the New Paltz regulation; board members may feel that going above and beyond the letter of the law could be controversial and invite pushback. The legal challenges in both New Castle and New Paltz were made by residents whose permit applications were denied by the board. The willingness of the towns to engage in these legal battles, rather than to issue the permit or allow a variance, speaks to the will of the towns to enforce their laws.

Applicants are incentivized to take wetland and watercourse regulations into account in their permit applications because any failure to do so could delay their permit or even result in the town issuing a stop work order, which could cause expensive delays for a developer or homeowner. Applications may include fees to cover the cost of an onsite inspection or require the applicant to pay for an inspection. Permit application fees for projects that may infringe on wetlands or watercourses in North Castle, New York, range from \$400 for installation of a deck or fence to \$1,250 for the construction of a new single-family home (57).

Addressing Violations

When property owners do not apply for permits, enforcing wetland and watercourse regulations may become more challenging. Residents, for example, may be unaware that their land or action is regulated and may therefore fail to apply for a permit. In this scenario, the town must learn about the alleged violation.

The town could learn about a violation when a resident applies for a permit for an unrelated activity and the violation is discovered during the review process. In this case, the violation may often be remedied during that second permitting process. For example, a resident who has built a shed in a watercourse buffer later applies for a permit to build a swimming pool, and the Town requires them to relocate the shed before issuing the permit for the pool.

Violations may also be reported by neighbors or town officials. New Paltz's regulation specifically includes the language that "any person may file a complaint" to allege a violation. In this case, the process to verify and remedy the alleged violation is less clear. Most often, the enforcing official (the Building Inspector or Code Enforcement Officer in New Paltz; Town Engineer, Building Inspectors, and Environmental Coordinator in New Castle; and the Building Inspector or Zoning Administrator in East Fishkill) will inspect the property, or hire a wetlands

inspector to do so, to verify whether a violation has, in fact, occurred.

If a violation has occurred, the enforcing official may try to work with the property owner to remedy the situation (e.g., to move the shed). If the property owner refuses to remedy the violation, the enforcing official might issue a ticket, issue a stop-work order (if a project is on-going), or summon the violator to appear before the Town Board or a Town Justice. The purpose of the summonses is not specified in the laws but is likely intended as an opportunity for the violator and Town Board to decide how to proceed. Practitioners note that the processes for when and how these steps should occur are not always clear. If, after these steps, a violator is still unwilling to stop or undo their harmful actions, then penalizing the violation may require legal action in the courts. The East Fishkill law, for example, notes that the Building Inspector or Zoning Administrator “with advice and consent of the Town Attorney, shall have the right to seek equitable relief to restrain and/or remedy a violation” (§110-11B). The New Castle law notes that civil penalties “may be recovered in an action brought by the Town in any court of competent jurisdiction” (§137-11A). New Paltz provides similar language (§139-18). Further, the Town Board, after a hearing with the violator, can order the restoration of the wetland to its prior condition, and these orders can be enforced through the courts. However, engaging in the court system may be time-consuming, expensive, and politically unpopular if it is seen as a poor use of town funds (which may be especially true for minor violations even though the compound effect of minor violations on wetlands and watercourses can be significant). A review of planning board meeting minutes in which they discuss violations of their respective wetland and watercourse laws suggests that towns most often settle violations (outside the permitting process) through negotiations with the property owner (e.g., the property owner agrees to stop the offending activity and to re-plant native grasses or to install a different filtration system).

One case that practitioners describe as particularly challenging involves actions by property owners who are not subject to the town’s jurisdiction. For example, county or state agencies who manage properties or infrastructure in and around the town may engage in activities that harm wetlands (e.g., clear cutting, dredging, fill). In these cases, the town must coordinate with those agencies and build norms around respecting town laws even when they are non-binding.

Preventing Foreseeable Violations

One practitioner noted that the permitting process is an excellent opportunity to address foreseeable violations. For example, homes that have wetlands, watercourses, or buffers in the yard near the house are more likely to have future violations as new homeowners, who may be unaware of the regulation, install swing sets or gardens. It may be possible to reduce the likelihood of future violations when reviewing a permit for new development. The board could recommend, for example, that homes be reoriented so that buffers are in side-yards rather than back-yards or that the parcel size of each home be increased (reducing the overall number of developments) so that each yard has sufficient space outside the buffer. This requires someone in the town environmental or planning board to take an active leadership role in scrutinizing developments not only for their strict compliance with the law but for their potential to promote or discourage future violations.

Educating Residents

Educating residents about the wetland and watercourse regulation can aid enforcement measures. Residents who understand what actions require a permit application and how to apply for a permit may be more likely to engage in the permitting process. Similarly, informing new homeowners about the regulation may increase compliance. This is likely to be particularly important

when the law covers intermittent streams of vernal pools, which the property owner may not recognize or may not realize are covered under the law. The 2019 New Paltz Annual Report on the wetland and watercourse regulation recommends the town engage in community outreach and training sessions to help residents understand what activities are or are not regulated and how to approach the permitting process for regulated activities.

Logistics

Implementing wetland and watercourse regulations may require towns to hire a wetlands inspector or other scientific expert if they do not have one on staff (e.g., someone who can identify a vernal pool or who can determine whether a stream is intermittent, and therefore regulated, or ephemeral, and therefore not regulated). New Paltz offers an inspection (at no cost to the property owner) once per parcel. When an inspection must occur as part of a permitting process, permit application fees can offset the cost of surveys to determine whether wetlands or watercourses are present on a property (cost estimates range from \$100 to \$400 per acre). Towns may be able to recover the cost of inspecting alleged violations from violators, but only if the violation is confirmed and only if the town actually collect a fine or penalty fee.

Additional implementation tasks include monitoring compliance, notifying property owners affected by updated maps, writing annual reports, and holding training sessions to educate property owners. These often fall to the Building Inspector or to volunteers from the Town Board, Planning Board, or Environmental Advisory Board. This means, however, that to some extent the successful enforcement of regulations depends on the continued leadership of dedicated volunteers. Some of these tasks will require funding. For example, according to the 2019 New Paltz Annual Report, updating the wetland and watercourse map could cost \$600-700 per year (annual updates required by

§139-6C). Anyone proposing to adopt a new wetland and watercourse regulation should keep in mind the additional tasks that someone will need to undertake to implement the regulation once passed (see also discussion on regulatory fatigue, p.19).



East Fishkill Flood Management Plan 2003

Conclusion

Local wetland and watercourse regulations offer local governments a tool with which to protect their natural resources and the many services they provide, such as flood management. Adopting regulations can be challenging, particularly in towns that have recently adopted related regulations or where residents view such regulations as interfering unnecessarily with their property rights. Counter-intuitively, high development pressure may help residents to see the value of additional land use control to preserve open spaces or the green character of their town. Towns that have successfully adopted wetland and watercourse regulations were led by individuals and organizations who helped officials and residents understand how protecting wetlands, watercourses, and buffers could promote local priorities. They connected abstract regulations with concrete benefits such as reduced pollution in a beloved river, protection of open spaces for recreation, habitat for charismatic animals, improved water quality, and reduced flood risk. Successful

communication simplifies the sometimes complicated regulatory and scientific language surrounding wetlands and watercourses. Experts may be particularly important in explaining details about intermittent streams and vernal pools, whose benefits may not be apparent to residents.

Enforcement of wetland and watercourse regulations relies to a large extent on the goodwill of residents (i.e., to dutifully apply for permits and report violations) and the willingness of violators to negotiate settlements or compromises. Enforcement is most effective when issues are raised during the permitting process, so regulations tend to be most effective at informing new development rather than limiting activities by existing residents. In an extreme case, where a property owner failed to get a permit or refused to cease a violating activity, enforcing penalties and restoration fees would rely primarily on the willingness of the town to seek relief through the court system. This may be too time-consuming and expensive for minor violations, even if the cumulative effect is damaging. The challenge of enforcing regulations may contribute to regulatory fatigue.

Towns considering adopting a wetland and watercourse regulation should think strategically about whether a comprehensive approach would be better received (e.g., a regulation that addresses flood management, wetlands and watercourses, and critical habitat). They should also consider the best time to propose a new regulation (e.g., allow time to lapse since the last regulation was adopted, so as not to contribute to fatigue, or immediately after a flood or other hazard has made the benefit of protecting these lands readily apparent). Tailoring communications to stress benefits that are local priorities can be an effective strategy.

Wetland and watercourse regulations have been adopted by numerous municipalities in New York. Notably, 78% of towns in Westchester County have adopted a wetland and watercourse regulation, which may be due to its high development pressure,

proximity to New York City, and the long-standing presence of a model ordinance in the county.

The high degree of overlap between floodplains and the lands that could potentially be regulated by wetland and watercourse buffers suggests that such regulations could be a strong tool for managing flood risk. Regulating development and harmful activities in buffers can both reduce the intensity of development in flood-prone areas and protect the health of wetlands and watercourses and their ability to direct and absorb floodwaters.

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Appendix A: Methods

The conclusions and recommendations in this report are based on a legal analysis of wetland and watercourse buffer regulations, interviews with local practitioners, spatial analysis of floodplains and regulation boundaries, document review, and physical site visits.

Legal Analysis

Building on work by [Griggs \(2010\)](#), we used the eCode360@ Library – an online portal of codified laws and municipal information – to survey local wetland and watercourse buffer regulations in Dutchess, Ulster, and Westchester counties. For every town in each of the counties, we recorded whether a wetland or stream buffer regulation has been established and, if so, the year in which it was adopted, the minimum size of the wetland regulated, and the size of the buffer. We also recorded whether the town had adopted a zoning ordinance, as zoning regulations may be used to effectively establish buffers in practice. Appendix C includes the full results, and details on the regulations in East Fishkill, New Paltz, and Westchester are included in Table 2.

Interviews

Between May and June 2021, we interviewed municipal and county government officials, consultants, and floodplain managers in New Paltz, Westchester, East Fishkill, and Gardiner, New York. Due to the COVID pandemic, interviews were conducted primarily by phone or Zoom. Participants were selected based on their expert knowledge of the adoption and enforcement of wetland and watercourse regulations. Participants included conservation professionals, lawyers, wetlands inspectors, building inspectors, floodplain managers, and city council representatives. During each interview, we asked about how and why wetland or watercourse regulations had been adopted in their town, what barriers and drivers had shaped the

regulation, how well the regulations are enforced, whether the regulations are thought to have affected flood exposure, and any challenges the town has faced with respect to the regulations. In the case of Gardiner, where no wetland and watercourse buffer has yet been adopted, we spoke about the buffers that have been proposed and barriers that have prevented adoption.

Document Analysis

To provide additional context for our legal analysis and interviews, we reviewed newspaper articles, government reports (e.g., annual reports on wetland regulation enforcement), and transcripts and summaries of town meetings where wetland regulations were discussed. We searched specifically for town meetings when regulations were first adopted, to understand objections to and support for the regulations, and reviewed a random sample of recent Planning Board or Environmental Board meeting minutes where enforcement of wetland buffer regulations was being discussed.

Spatial Analysis

David Richardson of The Nature Conservancy conducted a spatial analysis to model how many buildings and floodplains would be affected if local wetland buffer regulations were more widely adopted. In brief, he calculated how much of the floodplain (both as defined by FEMA and TNC) and how many buildings would be affected if every town in Dutchess, Ulster, and Westchester counties adopted wetland buffer regulations like those in East Fishkill, New Paltz, and New Castle, respectively. He compared the areas regulated by New York State Department of Environmental Conservation (DEC) and those regulated by East Fishkill, New Paltz, and New Castle to understand how much additional benefit local regulations could provide if they were widely adopted. For regulations that give a range of buffers (e.g., East Fishkill could regulate a buffer of anywhere from 50-

100 feet), both minimum and maximum areas were calculated. The number of buildings located inside regulated buffers or wetlands, and the age of those buildings, was also examined to help identify potential enforcement challenges or challenges that arise from applying new regulations in developed areas.

The analysis included several layers of data:

- Civil boundaries (villages are treated separately from their affiliated towns since they are subject to their own regulations) [source: NYS GIS Program Office]
- Environmental Overlay Districts (New Castle) [source: Westchester County GeoHub]
- FEMA-designated 100-year and 500-year floodplains, rasterized at 30m [source: DFIRM 2016]
- TNC-designated floodplains – defined as FEMA-100-year floodplains plus areas designated as a floodplain in two or more additional sources (100-year floodplains as modeled by FATHOM (data licensed by TNC); areas in SSURGO with a flood frequency of less than or equal to 100-year return interval; areas within NY Natural Heritage Program riparian buffer); FEMA floodplains do not fully capture areas exposed to flood risk, so the TNC-designed floodplain is an attempt to more fully capture flood exposure
- Wetlands and regulated buffers:
 - NYS DEC mapped wetlands
 - US Fish and Wildlife Service National Wetland Inventory (NWI) mapped wetlands
 - Westchester County GIS GeoHub mapped wetlands
 - According to the NYS DEC, East Fishkill, New Paltz, and New Castle regulations, wetlands subject to each regulation were identified and the relevant buffer added
 - Note that this analysis does not include vernal ponds, since they are rarely mapped, even though some local regulations (e.g., New Paltz) do regulate vernal ponds and surrounding areas

- Watercourses and water bodies from the USGS National Hydrography Dataset of waterbodies
- Building footprints and traits [source: Microsoft Building Footprints, and NYS parcel data, including building polygons for Ulster and Westchester counties]

Site Visits

Our team visited protected wetlands, wetland parks, and areas identified as potential violations in East Fishkill, New Paltz, and New Castle. Site visits were conducted in May 2021 and complied with social distancing and COVID protection measures. In each town, we identified: a building or road located within a NYS DEC wetland or buffer; a local park that included a wetland or protected areas; residential properties that were applying for permits to engage in restricted activities within regulated wetland buffers (identified through town planning records); and any residential properties noted in recent planning board meetings as potential violations of the wetland buffer regulations.

At each site, we examined the relative situation of the buildings, their proximity to the regulated wetlands, any observed actions that appear to violate the wetland buffer regulations (e.g., pollution entering wetlands or clear-cutting), and any signs or other public educational materials related to wetlands, buffers, and conservation or flood management. Site visits were intended to verify findings from interviews (e.g., how local parks inform public perception of wetlands) and spatial analysis (e.g., to confirm buildings that appear to be infringing on wetlands are doing so when viewed in person).

Photos used in this report, unless otherwise credited, were taken by the report authors during these site visits.

Appendix B: Wetland and Watercourse Regulations in New Paltz, New Castle, East Fishkill

	New Paltz	New Castle	East Fishkill
Purpose (Quoted)	It is the purpose of this chapter to protect the health, safety and well-being of the citizens of the Town of New Paltz and of property therein by preventing the despoliation and destruction of wetlands, waterbodies and watercourses, and associated buffer areas, collectively referred to in § 139-5 herein as "regulated areas," recognizing their varying ecological, water quality, and recreational values. The Town of New Paltz hereby regulates activities that may cause a substantial adverse effect on the function served by regulated areas or the benefits derived therefrom.	The Town Board of the Town of New Castle finds and declares it to be the public policy of the Town to preserve, protect and conserve its wetlands, including water bodies and watercourses, and the benefits derived therefrom, to prevent despoliation and destruction and to regulate the use and development thereof and to secure the natural benefits of wetlands, water bodies and watercourses consistent with the general welfare and beneficial economic and social development of the town.	These regulations are enacted with the intent of providing a reasonable balance between the rights of the individual property owner to the free use of his property and the right to enjoy and benefit from preservation of wetlands, water bodies and watercourses of present and future generations. Therefore, this article recognizes the rights of owners of property in or near wetlands to use their property for reasonable purposes consistent with other regulations and controls... provided that such use, in the judgment of the appropriate agencies or officials of the Town of East Fishkill, does not result in a significant adverse impact to the wetland systems...
Wetland Benefits (Summary - Items of note italicized)	improve water quantity and quality; reduce flooding and erosion; habitat and biodiversity; recreation; <i>"visual relief"</i> and <i>"sense of connection with the natural world"</i> ; educational space. Specifically notes buffers.	protecting water resources; reducing flooding and runoff; habitat and biodiversity; pollution control; <i>"visual relief from development"</i> ; educational spaces.	flooding and runoff, maintain groundwater supplies, water retention, recreational, natural beauty, and ecological function
Role of Develop. (Quoted)	In recent years, population growth and economic and recreational activities have made and will continue to make new and greater demands on waterbodies and watercourses for boating, fishing, bathing and water sports and on the lands adjacent thereto for access areas and recreation.	Rapid population growth, attended by housing, road and other construction, and increasing demands upon natural resources are found to be encroaching upon, despoiling, polluting or eliminating many of the town's wetlands, water bodies, watercourses and other natural resources and processes associated therewith.	Rapid population growth, attended by housing, road and other construction, and increasing demands upon natural resources, are found to be encroaching upon, despoiling, polluting or eliminating many of the Town's wetlands, water bodies and watercourses and processes associated therewith.

Continued

	New Paltz	New Castle	East Fishkill
Wetlands Definition (Quoted – method of defining in bold)	<p>A regulated area that comprises hydric soils and/or is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, vernal pools, wet meadows, fens and similar areas. For the purposes of this regulation, wetlands are defined in accordance with the methodology set forth in NYCRR Part 664 and in the 1987 Federal Wetlands Delineation Manual. Regulated wetlands do not include detention, infiltration and retention basins. A wetland must have an area greater than 1/10 acre to be a regulated area under this chapter.</p>	<p>All areas of at least 1/10 of an acre that comprise hydric soils and/or are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of hydrophytic vegetation as defined by the Federal Interagency Committee for Wetlands Delineation 1989; Federal Manual for Identifying and Delineating Jurisdictional Wetlands;</p> <p>B. Watercourses as defined in this section.</p> <p>C. Any area either larger or smaller than 1/10 of an acre, meeting all other requirements of a wetland, within 100 feet of other similar areas shall be considered as one wetland if the total of the areas is greater than 1/10 of an acre.</p>	<p>Wetlands possess three essential characteristics: hydrophytic vegetation, hydric soils and wetland hydrology, all of which must be present in an area to be considered a wetland. The criteria shall be the ones used to determine the presence of hydrophytic vegetation, hydric soils and hydrological indicators as set forth in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, dated January 1989. Wetlands shall be all portions of NYSDEC regulated wetlands and buffers, all portions of USACOE regulated wetlands, and all portions of "isolated" wetlands not regulated by either NYSDEC or USACOE and with an area of 1/2 acre or more. Further, the area requirements for all wetlands shall mean the total area of the wetland, not just the portion on the applicant's lot.</p>
Minimum Regulated Ordinance	<p>1/10th acre Vernal pools: 100ft²</p>	<p>1/10th acre (or smaller if within 100 feet of another wetland and total area >1/10th acre) <i>[All wetlands in Env Protection Overlay areas]</i></p>	<p>½ acre</p>
Buffer	<p>1/10th – 1 acre: 50 ft 1+ acre: 100 ft Vernal pool: 100 ft</p>	<p>100 ft <i>[150 ft for wetlands in Env Protection Overlay areas]</i></p>	<p>½-1 acre: min 50 ft 1-2 acre: 50-100 ft 2-3 acre: 75-100ft 3+ acre: 100ft *Within range, buffer determined by planning board</p>

Continued

	New Paltz	New Castle	East Fishkill
Watercourses Definition (Quoted)	<p>WATERBODY any natural or artificial pond, lake, or other area that usually or intermittently contains water and that has a discernible shoreline. Regulated waterbodies do not include detention and retention, infiltration and detention basins [1/10th acre minimum]</p> <p>WATERCOURSE any natural, permanent, seasonal, or intermittent channel or water segment, rivers, streams, brooks, naturally occurring impoundments within such channels or other waterways that are contained within, flow through, or border on the Town of New Paltz. A watercourse contains a discernible channel, bed, banks and/or berm and usually flows in a particular direction [Not artificial]</p> <p>INTERMITTENT WATERCOURSE a stream, creek, or brook, through which surface water travels in a well-defined channel ... for at least three consecutive months in a twelve-month period except ...waterways specifically designed and constructed to serve a stormwater conveyance or treatment function, such as grassy swales, drainage ditches</p>	<p>WATERCOURSE Any natural or artificial, permanent or intermittent, public or private surface water body or surface water segment, such as ponds, lakes, reservoirs, rivers, streams, brooks or waterways, that are contained within, flow through or border on the Town of New Castle.</p>	<p>WATER BODY Any body of water that exists at least three months of the year.</p> <p>WATERCOURSE Any identifiable channel through which water flows continuously or intermittently.</p>
Watercourses Buffers	<p>Waterbody: Same as wetland Perennial watercourse: 100 feet (except Wallkill River: 200 feet) Intermittent stream: 50 ft</p>	<p>100 feet (watercourses are also defined as wetlands)</p>	<p>50ft</p>

Continued

	New Paltz	New Castle	East Fishkill
Regulated Activities (Summarized - Items of note italicized)	draining, dredging, excavation, dumping, erecting structures, introduction of pollution (e.g., sewage), alteration of natural features (direction of water flow), clear cutting, displacement of beaver dams (some exceptions), high volume water withdrawals, installing pool drainage or pipes, "any other activity that is determined by the wetlands inspector... to have the potential for substantial adverse effects on the regulated areas"	draining, dredging, excavation, dumping, erecting structures, installation of cables, pipes, or wells, introduction of pollution (e.g., sewage), alteration of natural features (direction of water flow) or drainage, clear cutting, animal grazing (<i>including horses</i> but excluding animals "producing agricultural products")	draining, dredging, excavation, dumping, erecting structures (<i>or roads or driveways</i>), digging wells, introduction of pollution (e.g., sewage), clear cutting, soil testing, off-road vehicle usage, <i>application of herbicides or pesticides</i> , repairing water control structures, alteration of natural features (direction of water flow)
Exemptions (Summarized - Items of note italicized)	recreation, <i>agriculture</i> , "lawful pre-existing actions and uses"; Town of New Paltz Highway Department exempted from process	Projects that already have a wetland permit <i>[2:1 replacement in Env Protection Overlay areas]</i>	Prior completed projects or ongoing projects that already were approved so long as those plans do not change
Enforcement (Summarized - Items of note italicized)	Apply for permit; Evaluated by Planning Board with input from Wetlands Inspector and Environmental Council Board; Building and Wetlands Inspector enforce	Apply for permit; Evaluated by the Planning Board, Environmental Review Board or Coordinator; Town Engineer, Building Inspector, and Environmental Coordinator issue tickets	Apply for permit; Evaluated by Zoning, Planning, or Town Board with advice of Environmental Advisory Board
Penalties (Summarized - Items of note italicized)	Civil penalty <\$5,000; Each <i>day</i> a separate violation; <i>and</i> a fine \$500-1,000 (second offense \$1,000-2,000 and/or <15 days in jail); <i>Court may order restoration of wetland</i>	Civil penalty <\$3,000; Each <i>day</i> a separate violation; <i>and</i> a fine \$500-1,000 (second offense \$1,000-2,000 and/or <15 days in jail)	Civil penalty < \$3,000; Each <i>week</i> a separate violation; or a fine <\$500 or up to 15 days in jail

New Paltz Wetland and Watercourse Regulation

DEFINITION QUALITY VERNAL POOL

1. A regulated area that comprises a seasonally flooded, isolated pool of standing water that is devoid of naturally occurring fish and that persists, in a year of average precipitation, for at least two months. (Annual precipitation in Ulster County normally ranges from 40 inches to 48 inches).
2. Quality vernal pools are those that provide essential breeding habitat for pool-breeding amphibians, including, but not limited to, the following species
 - a. Spotted salamander;
 - b. Marbled salamander;
 - c. Jefferson salamander;
 - d. Blue-spotted salamander; and
 - e. Wood frog.
3. Quality vernal pools must have an area greater than 100 square feet to be regulated areas under this chapter.
4. Quality vernal pools must satisfy any of the following criteria set forth below:
 - a. There is evidence of a naturally occurring confined basin depression, with no permanently flowing outlet, and evidence of nonincidental breeding by one or more species of obligate vernal pool species (wood frog, spotted salamander, Jefferson salamander, marbled salamander, fairy shrimp, clam shrimp, fingernail clams). Acceptable evidence of nonincidental breeding includes:
 - i. Frog breeding choruses and/or mated pairs;
 - ... Fingernail clams; or
 - b. There is evidence of:
 - i. A naturally-occurring confined basin depression with no permanently flowing outlet; and
 - ii. Standing water that dries up during the year or which, for other reasons, does not contain reproducing fish; and
 - iii. Nonincidental presence of two or more species of facultative vernal pool species (blue-spotted salamander, spring peeper, gray tree frog, Fowler's toad, pickerel frog, leopard frog, four-toed salamander, red-spotted newt, spotted turtle, wood turtle, painted turtle, snapping turtle); or
 - c. There is evidence of a naturally-occurring confined basin depression with no permanently flowing outlet and evidence of standing water that dries up during the year or which, for other reasons, does not contain reproducing fish, for which:
 - i. Sufficient accessible critical terrestrial habitat exists to support vernal pool-breeding amphibians; and
 - ii. The conditions of either Subsection (4)(a) or (b) of this definition is likely to be satisfied.



Vernal pool in New Paltz

Appendix C: Wetland and Watercourse Buffer Regulations in Dutchess, Ulster, and Westchester Counties New York

Dutchess County

Community	Wetland Ordinance	Stream Ordinance	Ordinance Name (GL - General Legislation)	Minimum Size Regulated Wetland	Wetland Buffer	Stream Buffer	Zoning Ordinance
Amenia	no	no		12.4 acre	100 ft.	n/a	yes (enforces NYSDEC and federal wetland and stream regs)
Beekman	amended 2010	Included	Zoning 155-52 Wetland, water body and watercourse protection	no min.	75 ft.	50 ft.	yes (contains wetland and watercourse regulation)
Clinton	2008	Included	Zoning 250-78 Freshwater wetlands, watercourses, lakes, ponds and floodplains	1/2 acre	1/1-5 acres: 50ft. 5-12.4 acres: 100ft	100 ft.	yes (contains wetland and watercourse regulation)
Dover	no	no (see Stream Overlay)		12.4 acre	100 ft.	n/a	yes (enforces NYSDEC and federal wetland and stream regs)
East Fishkill	2007 (amended 2017)	Included	GL Ch 110 Freshwater Wetlands, Water bodies and Watercourses	1/2 acre	1-2 acres: 50 ft. 2-3 acres: 75ft. 3+ acres: 100 ft.	50 ft.	yes
Fishkill, Town	2003	Included	GL Ch 82 Freshwater Wetlands, Watercourses, and Water bodies	1 acre	1-2 acres: 50 ft. 2-3 acres: 75ft. 3+ acres: 100 ft	30-50 ft.	yes

Community (Dutchess Cont'd)	Wetland Ordinance	Stream Ordinance	Ordinance Name (GL - General Legislation)	Min Size Regulated Wetland	Wetland Buffer	Stream Buffer	Zoning Ordinance
Fishkill, Village	no	no		n/a	n/a	n/a	yes (permits review of any alteration to wetland or watercourse)
Hyde Park	1976	no	GL Ch 63 Freshwater Wetlands	n/a	n/a	n/a	yes (enforces state wetland law)
LaGrange	1994	Included	GL Ch 124 Freshwater Wetlands, Watercourses, and Water bodies	1 acre	1-2 acres: 50 ft. 2-3 acres: 75ft. 3+ acres: 100 ft	20 ft. 200 ft for special rivers	yes
Milan	(2007 law invalidated by courts)	no		n/a	n/a	n/a	yes
Millbrook	no	no					yes (land conservation areas include setbacks)
Millerton	no	no		n/a	n/a	n/a	yes
North East	no	no		n/a	n/a	n/a	yes
Pawling, Town	1993	Included	GL Ch 111 Freshwater Wetlands and Watercourse Protection	1/4 acre	100 ft.	100 ft.	yes
Pawling, Village	no	no		n/a	n/a	n/a	yes
Pine Plains	1976	no	GL Ch 165 Freshwater Wetlands	n/a	n/a	n/a	yes (enforces state wetland law)
Pleasant Valley	2003	Included	GL Ch 53 Wetland, Water Body and Watercourse Protection	1/2 acre	1/2-1 acres: 25 ft. 1-2 acres: 50ft. 2-3 acres: 75 ft 3+: 100 ft.	25- 100 ft.	yes

Community (Dutchess Cont'd)	Wetland Ordinance	Stream Ordinance	Ordinance Name (GL - General Legislation)	Min Size Regulated Wetland	Wetland Buffer	Stream Buffer	Zoning Ordinance
Poughkeepsie	2003	Included	GL Ch 116 Aquatic Resource Protection	0.1 acre	1-5 acres: 25 ft. 5-9 acres: 50 ft. 9-12 acres: 100 ft.	25-50 ft.	yes
Red Hook, Town	no	no		n/a	n/a	n/a	yes (coordinates state and federal laws)
Red Hook, Village	no	no		n/a	n/a	n/a	yes
Rhinebeck, Town	2009	Included	GL Ch 120 Wetlands	no min.	100 ft.	100 ft.	yes
Rhinebeck, Village	no	no		n/a	n/a	n/a	yes (Land Conservation Overlay buffers)
Stanford	1976	no	GL Ch 103 Freshwater Wetlands	n/a	n/a	n/a	yes (enforces state wetland law)
Tivoli	no	no		n/a	n/a	n/a	yes
Union Vale	no	no		n/a	n/a	n/a	yes (permit review 100ft of NYSDEC stream or wetland)
Wappinger	2005	Included	GL Ch 137 Freshwater Wetland, Waterbody and Watercourse Protection	no min.	100 ft.	100 ft.	yes
Wappingers Falls	no	no		n/a	n/a	n/a	yes
Washington	2011 (replaces prior zoning language)	no	Zoning 396 Wetlands and Watercourse Law	1/4 acre	1/4-1 acre: 50 ft 1 acre + : 100 ft	Perennial: 100 ft. Intermittent: 50 ft.	yes (here)

Ulster County

Community	Wetland Ordinance	Stream Ordinance	Ordinance Name (GL - General Legislation)	Minimum Size Regulated Wetland	Wetland Buffer	Stream Buffer	Zoning Ordinance
Denning	no	no		n/a	n/a	n/a	yes
Ellenville	no	no		n/a	n/a	n/a	yes
Esopus	no	no		n/a	n/a	n/a	yes
Gardiner	no	no		n/a	100 ft.	150 ft.	yes (may impose buffers and require mitigation plans)
Hardenburgh	no	no		n/a	n/a	250 ft.	yes (enforces NYSDEC wetland buffer)
Hurley	no	no		n/a	n/a	n/a	yes (may impose buffers and require mitigation)
Kingston, City	no	no		n/a	n/a	n/a	yes
Kingston, Town	no	no		n/a	n/a	n/a	yes
Lloyd	1983	no	GL Ch 120 Freshwater Wetlands	no min.	100 ft.	n/a	yes
Marbletown	no	no		n/a	n/a	n/a	yes
Marlborough	no	no		n/a	n/a	n/a	yes
New Paltz, Town	2011	Included	GL Ch 139 Wetlands and Watercourse Protection	1/10 acre Vernal pools: 100ft ²	1/10th – 1 acre: 50 ft 1+ acre: 100 ft Vernal pool: 100 ft	Perennial: 100 ft (Wallkill River: 200 ft) Intermittent: 50 ft	yes
New Paltz, Village	no	no					yes (includes watercourses)
Olive	no	no		n/a	n/a	n/a	yes
Plattekill	1976	no	GL 52 Freshwater Wetlands	12.4 acres	100 ft.	n/a	yes (wetlands law assumes authority of state-reg'd wetlands)

Community (Ulster Cont'd)	Wetland Ordinance	Stream Ordinance	Ordinance Name (GL - General Legislation)	Min Size Regulated Wetland	Wetland Buffer	Stream Buffer	Zoning Ordinance
Rochester	no	no		n/a	n/a	n/a	yes
Rosendale	no	no		n/a	n/a	n/a	yes
Saugerties, Town	1976	no	GL Ch 133 Freshwater Wetlands	12.4 acres	100 ft.	n/a	yes (wetlands law assumes authority of state-reg'd wetlands)
Saugerties, Village	no	no		n/a	n/a	n/a	yes (designates a wetland district)
Shandaken	no	no		n/a	n/a	n/a	yes (includes provision enforcing NYSDEC wetland regs)
Shawangunk	no	no		n/a	n/a	n/a	yes (addresses wetlands in minimum lot size requirements)
Ulster, Town	no	no		n/a	n/a	n/a	yes (addresses wetlands in minimum lot size requirements)
Wawarsing		Included	Zoning 112-24 Stream and wetland setbacks	0.1 acre	100 ft.	50-100 ft.	yes (authorizes setbacks from wetlands and streams)
Woodstock	amended 2009, 2011	Included	Zoning 260-34 Wetland and watercourse protection standards	no min.	if ≤ 0.1 acre, 50 ft. if > 0.1 acre, 100 ft	30-100 ft.	yes (contains wetland and watercourse regulation)

Community	Wetland Ordinance	Stream Ordinance	Ordinance Name (GL - General Legislation)	Minimum Size Regulated Wetland	Wetland Buffer	Stream Buffer	Zoning Ordinance
Ardsley	2003	Included	Zoning Law: Article X Environmental Protection	no min.	25 ft.	25 ft.	yes (includes w&w reg)
Bedford	1991 (replaced 2014)	Included	GL Ch 122 Wetlands	no min.	100 ft.	100 ft.	yes
Briarcliff Manor	1976 (replaced 2015)	no	GL Ch 131 Freshwater Wetlands	no min.	100 ft.	n/a	yes
Bronxville	no	no		n/a	n/a	n/a	yes
Buchanan	1988	Included	GL Ch 203 Wetlands	1/10 acre	100 ft.	100 ft.	yes
Croton-On-Hudson	2007	Included	GL Ch 227 Wetlands	5,000 sq. ft (or vernal pool)	120 ft.	120 ft.	yes
Dobbs Ferry	no	no		4,000 sq. ft	discretionary	n/a	yes (may impose buffers and require mitigation plans)
Eastchester	no	no		n/a	n/a	n/a	yes (requires consideration of wetlands)
Elmsford	1976	no	GL 179 Freshwater Wetlands	12.4 acres	100 ft.	n/a	yes (wetlands law assumes authority of state-reg'd wetlands)
Greenburgh	1976 (replaced 2003)	Included; also Ch 270 1991	Land Use Ch 280 Wetlands and Watercourses	no min.	100 ft.	100 ft.	yes

Community (Westchester Cont'd)	Wetland Ordinance	Stream Ordinance	Ordinance Name (GL - General Legislation)	Minimum Size Regulated Wetland	Wetland Buffer	Stream Buffer	Zoning Ordinance
Harrison	1976 (amended 2002)	no	GL Ch 149 Freshwater Wetlands	no min.	100 ft.	no	yes
Hastings-on-Hudson	no	no		n/a	n/a	n/a	yes (consider wetlands)
Irvington	2003	Included	Zoning Law: Article XXV Freshwater Wetlands	no min.	25 ft. (100 if construction)	25 ft.	yes (includes w&w reg)
Larchmont	1976	no	Land use Ch 341 Freshwater Wetlands	1/4 acre	100 ft.	n/a	yes
Lewisboro	2004	Included	GL Ch 217 Wetlands and Watercourses	no min.	150 ft.	150 ft.	yes
Mamaroneck, Town	2003 (amended 2021)	Included	GL Ch 114 Wetlands and Watercourses	2,500 sq. ft.	100 ft.	100 ft.	yes
Mamaroneck, Village	1977 (amended 2007)	no	GL Ch 192 Freshwater Wetlands	2,500 sq. ft.	100 ft.	n/a	yes
Mount Vernon	no	n/a		n/a	25 ft.	n/a	yes (wetland setback)
Mount Kisco	1991	no	GL Ch 107 Wetlands and Drainage Control	no min.	100 ft.	100 ft.	yes
Mount Pleasant	1976	Included (see also Ch 185)	GL Ch 111 Freshwater Wetlands	no min.	50 ft.	50 ft.	yes
New Castle	1979 (replaced 1990, amended 2019)	Included (see also Ch 135)	GL Ch 137 Wetlands	1/10 acre	100 ft.	100 ft.	yes
New Rochelle	no	n/a		no min.	35-75 ft.	n/a	yes (wetland setback)

Community (Westchester Cont'd)	Wetland Ordinance	Stream Ordinance	Ordinance Name (GL - General Legislation)	Minimum Size Regulated Wetland	Wetland Buffer	Stream Buffer	Zoning Ordinance
North Castle	2012	Included	GL Ch 209 Wetlands and Watercourse Protection	no min.	100 ft.	100 ft. (slope adjusted)	yes
North Salem	2010 (amended 2020)	Included	GL Ch 107 Freshwater Wetlands	no min.	100 ft.	100 ft.	yes
Ossining, Town	1998	Included	GL Ch 105 Freshwater Wetlands, Watercourses and Water Body Protection	no min.	100 ft.	50 ft.	yes
Ossining, Village	2020	Included	GL Ch 149 Freshwater Wetlands	no min.	100 ft.	50 ft.	yes
Peekskill	1976	no	GL Ch 294 Freshwater Wetlands	12.4 acres	100 ft.	n/a	yes (wetlands law assumes authority of state-reg'd wetlands)
Pelham	1987	no	GL Ch 49 Freshwater Wetlands	no min.	n/a	n/a	yes
Pleasantville	1987	Included	GL Ch 182 Wetlands	no min.	50 ft.	50 ft.	yes
Port Chester	no	no		n/a	n/a	n/a	yes
Pound Ridge	1986	no	GL Ch 63 Freshwater Wetlands	1/4 acre	150 ft.	n/a	yes
Rye Brook	2021	Included	GL 245 Wetlands and Watercourses	no min.	100 ft.	100 ft.	yes
Rye	1991	Included	GL Ch 195 Wetlands and Watercourses	no min.	100 ft.	100 ft.	yes
Sacarsdale	1976 (amended 2011)	Included (see also Ch 302)	GL Ch 171 Freshwater Wetlands	no min.	25 ft.	25 ft.	yes

Community (Westchester Cont'd)	Wetland Ordinance	Stream Ordinance	Ordinance Name (GL - General Legislation)	Minimum Size Regulated Wetland	Wetland Buffer	Stream Buffer	Zoning Ordinance
Sleepy Hollow	1990 (Amended 2019)	Included	GL Ch 418 Wetlands and Watercourses	no min.	100 ft.	100 ft.	yes
Somers	1990 (replaced 1997, amended 2003)	Included	GL Ch 167 Wetlands and Watercourse Protection	5,000 sq. ft.	100 ft.	100 ft.	yes
Tarrytown	2003	Included	GL Ch 302 Wetlands and Watercourses	no min.	150 ft.	150 ft.	yes
Tuckahoe	no	no		n/a	n/a	n/a	yes
White Plains	1996	Included	Code Sec 3-5 Environmentally Sensitive Sites and Features	1,000 sq. ft.	n/a	100 ft.	yes
Yonkers	no	no		n/a	n/a	n/a	yes
Yorktown	1991	Included	GL Ch 178 Freshwater Wetlands	1,000 sq. ft.	100 ft.	100 ft.	yes

Appendix D: Municipal Lands and Buildings Potentially Affected by Wetland and Watercourse Buffer Regulations

Dutchess County

Municipality	% Municipal Lands			# Buildings			
	NYSDEC Wetlands Regulation	East Fishkill-style Regulation (max. buffer)	Change NYSDEC-EF	In Municipality	NYSDEC Buffer Regulation	East Fishkill-style Regulation (max. buffer)	Change NYSDEC-EF
Amenia, Town	7.2%	18.8%	11.6%	1961	46	138	92
Beacon, City	1.2%	11.2%	10.0%	3914	0	50	50
Beekman, Town	4.4%	12.7%	8.3%	4619	47	116	69
Clinton, Town	10.6%	20.7%	10.1%	2603	94	181	87
Dover, Town	9.1%	19.6%	10.6%	3466	56	185	129
East Fishkill, Town	17.0%	24.0%	7.1%	11081	420	634	214
Fishkill, Town	4.9%	27.5%	22.7%	5227	89	167	78
Fishkill, Village	0.0%	13.1%	13.1%	540	0	8	8
Hyde Park, Town	8.0%	27.7%	19.7%	7600	278	523	245
La Grange, Town	9.8%	19.3%	9.5%	6540	119	230	111
Milan, Town	6.6%	17.4%	10.8%	1543	32	116	84
Millbrook, Village	5.3%	10.6%	5.2%	537	0	4	4
Millerton, Village	11.7%	18.3%	6.6%	370	6	13	7
North East, Town	9.1%	18.8%	9.7%	1418	29	96	67
Pawling, Town	10.0%	19.6%	9.6%	2627	51	231	180
Pawling, Village	16.0%	20.3%	4.2%	587	27	34	7
Pine Plains, Town	9.6%	21.1%	11.5%	1453	21	80	59
Pleasant Valley, Town	8.4%	20.3%	11.9%	4269	86	240	154
Poughkeepsie, City	0.6%	14.5%	13.9%	6603	0	34	34
Poughkeepsie, Town	3.9%	19.0%	15.1%	13059	100	260	160
Red Hook, Town	12.9%	32.6%	19.7%	3600	80	224	144
Red Hook, Village	4.4%	7.8%	3.4%	758	5	8	3
Rhinebeck, Town	8.7%	28.6%	20.0%	2412	47	138	91
Rhinebeck, Village	1.5%	10.1%	8.5%	1017	2	15	13
Stanford, Town	7.3%	18.9%	11.6%	2309	36	150	114
Tivoli, Village	1.5%	9.1%	7.7%	475	0	4	4
Union Vale, Town	6.6%	15.3%	8.7%	2252	38	73	35
Wappinger, Town	9.4%	24.4%	15.0%	7398	94	216	122
Wappingers Falls, Village	0.0%	14.6%	14.6%	1241	0	52	52
Washington, Town	7.0%	16.1%	9.1%	2111	28	81	53
AVERAGE	7.1%	18.4%	11.3%	3164	49	125	76
STD DEVIATION	4.4%	6.0%	4.7%	3135	61	122	66

Ulster County

Municipality	% Municipal Lands			In Municipality	# Buildings		
	NYSDEC Wetlands Regulation	New Paltz-style Regulation	Change NYSDEC-NP		NYSDEC Buffer Regulation	New Paltz-style Regulation	Change NYSDEC-NP
Denning	0.4%	9.6%	9.2%	614	0	93	93
Ellenville, Village	0.0%	11.1%	11.1%	1295	0	75	75
Esopus	8.4%	30.7%	22.3%	3975	63	343	280
Gardiner	4.1%	16.5%	12.3%	3001	33	249	216
Hardenburgh	0.1%	9.2%	9.1%	408	0	87	87
Hurley	3.2%	30.3%	27.1%	3143	27	210	183
Kingston, City	1.3%	21.2%	20.0%	7363	0	93	93
Kingston, Town	3.1%	11.1%	8.1%	463	1	47	46
Lloyd	12.6%	33.3%	20.7%	4102	118	552	434
Marbletown	4.6%	16.3%	11.7%	3736	47	312	265
Marlborough	5.8%	23.3%	17.5%	4123	75	407	332
New Paltz, Town	10.8%	28.5%	17.7%	3099	47	301	254
New Paltz, Village	2.0%	17.7%	15.7%	983	15	44	29
Olive	2.4%	21.9%	19.5%	2824	16	309	293
Plattekill	16.2%	32.5%	16.3%	4475	188	514	326
Rochester	3.4%	12.5%	9.1%	4829	27	326	299
Rosendale	3.3%	22.5%	19.2%	2707	24	275	251
Saugerties, Town	3.0%	21.6%	18.6%	7409	31	565	534
Saugerties, Village	12.7%	39.5%	26.8%	1371	11	84	73
Shandaken	0.0%	9.8%	9.8%	2341	0	612	612
Shawangunk	5.9%	20.5%	14.6%	5295	125	553	428
Ulster	4.6%	23.1%	18.5%	5179	69	586	517
Wawarsing	5.3%	16.1%	10.8%	5179	26	369	343
Woodstock	0.9%	12.5%	11.5%	3453	19	471	452
AVERAGE	4.8%	20.5%	15.7%	3390	40	312	271
STD DEVIATION	4.4%	8.6%	5.5%	1960	47	191	167

Westchester County

This table presents results from an analysis using watercourses identified by Westchester County (WC version).

Municipality	% Municipal Lands			In Municipality	# Buildings (WC version)		
	NYSDEC Wetlands Regulation	New Castle-style Regulation	Change NYSDEC-NC		NYSDEC Buffer Regulation	New Castle-style Regulation	Change NYSDEC-NC
Ardsley, Village	0.0%	18.6%	18.6%	1442	0	93	93
Bedford, Town	8.6%	36.7%	28.1%	6518	108	918	810
Briarcliff Manor, Village	8.7%	24.8%	16.1%	2163	46	243	197
Bronxville, Village	0.0%	5.6%	5.6%	1138	0	24	24
Buchanan, Village	1.4%	27.1%	25.7%	891	0	56	56
Cortlandt, Town	5.5%	41.3%	35.9%	9856	143	1617	1474
Croton-on-Hudson, Village	2.4%	68.8%	66.5%	2439	2	172	170
Dobbs Ferry, Village	0.0%	13.0%	13.0%	2285	0	66	66
Eastchester, Town	0.8%	18.9%	18.1%	4789	0	145	145
Elmsford, Village	0.0%	12.3%	12.3%	1147	0	39	39
Greenburgh, Town	0.1%	36.9%	36.8%	10948	1	864	863
Harrison, Village	1.5%	32.8%	31.4%	6738	10	807	797
Hastings-on-Hudson, Village	0.0%	19.7%	19.7%	2125	0	70	70
Irvington, Village	0.0%	20.9%	20.9%	1504	0	160	160
Larchmont, Village	0.0%	11.1%	11.1%	1717	0	61	61
Lewisboro, Town	19.0%	47.5%	28.5%	4805	330	1245	915
Mamaroneck, Town	0.0%	86.3%	86.3%	3176	0	232	232
Mamaroneck, Village	0.4%	29.5%	29.0%	4221	0	353	353
Mount Kisco, Village	14.7%	34.7%	20.0%	2038	25	248	223
Mount Pleasant, Town	2.2%	40.0%	37.8%	8032	17	786	769
Mount Vernon, City	0.0%	6.2%	6.2%	9162	0	175	175
New Castle, Town	9.9%	38.1%	28.2%	5635	182	1327	1145
New Rochelle, City	0.3%	33.6%	33.3%	13605	1	434	433
North Castle, Town	9.3%	47.8%	38.5%	4438	101	1015	914
North Salem, Town	13.5%	46.6%	33.1%	2441	52	595	543
Ossining, Town	0.3%	69.6%	69.3%	1467	2	258	256
Ossining, Village	0.8%	17.3%	16.5%	4243	12	268	256
Peekskill, City	0.5%	35.2%	34.7%	4519	8	325	317
Pelham Manor, Village	0.0%	9.3%	9.3%	1637	0	24	24
Pelham, Village	0.0%	10.6%	10.6%	1651	0	58	58
Pleasantville, Village	0.9%	25.9%	25.0%	1828	0	159	159
Port Chester, Village	0.0%	5.1%	5.1%	4665	0	91	91
Pound Ridge, Town	16.5%	43.8%	27.3%	2305	127	574	447
Rye Brook, Village	0.4%	22.9%	22.5%	2776	0	246	246
Rye, City	1.1%	50.1%	49.0%	4553	11	354	343
Rye, Town	0.0%	100.0%	100.0%	n/a	n/a	n/a	n/a
Scarsdale, Village	0.7%	20.4%	19.7%	5611	11	425	414
Sleepy Hollow, Village	0.0%	20.9%	20.9%	1482	0	85	85
Somers, Town	11.0%	40.0%	29.1%	7061	182	1155	973
Tarrytown, Village	3.0%	23.9%	20.9%	2112	5	110	105
Tuckahoe, Village	0.0%	11.2%	11.2%	1176	0	25	25
White Plains, City	0.8%	21.7%	21.0%	9490	12	500	488
Yonkers, City	0.1%	20.2%	20.1%	27006	4	635	631
Yorktown, Town	9.5%	39.0%	29.4%	11559	275	2186	1911
AVERAGE	3.3%	31.5%	28.2%	5671	43	479	436
STD DEVIATION	5.2%	20.6%	19.8%	5777	77	515	445

UNIVERSITY OF DELAWARE
DISASTER RESEARCH CENTER

116 Graham Hall, 111 Academy Street
Newark, DE 19716

drc-mail@udel.edu
302-831-6618
drc.udel.edu



The Nature Conservancy in New York
322 8th Avenue, 14th Floor
New York, NY 10001

212-997-1880
natureny@tnc.org
www.nature.org

