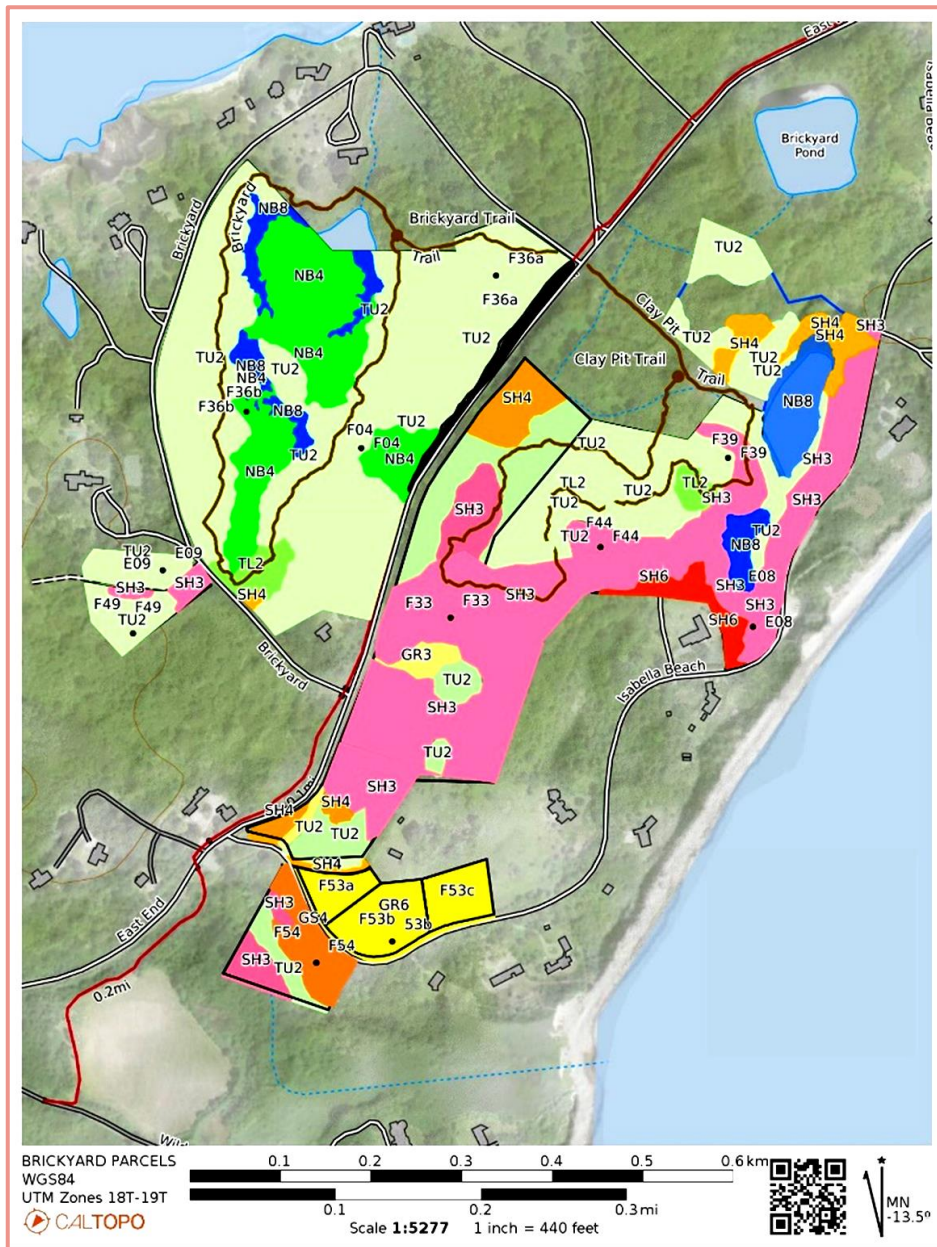




WILDFIRE RISK ASSESSMENT OF OWNED OR OVERSEEN LAND PARCELS UNDER THE CARE OF THE FERGUSON MUSEUM LAND TRUST, FISHERS ISLAND NEW YORK

Conducted by Robert A.
Panko, Risky Business Incident
Management LLC April thru
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Executive Summary

Based upon the very active fall wildfire season in the Northeast United States that occurred in 2024, the Ferguson Museum Land Trust (FMLT) obtained the services of Robert (Bob) Panko of Risky Business Incident Management LLC to evaluate the wildland fire risk upon its land parcels on Fishers Island. The Land Trust requested an assessment of the overall risks of wildland fires occurring on these lands that could potentially put adjacent neighbors in harm's way. This report is to complete the wildland fire risk assessment on these parcels.¹

These parcels are mostly natural landscapes, managed to conserve open space, provide recreational opportunities and maintain natural habitats. These parcels are scattered throughout Fishers Island, and are embedded adjacent to private lands and private and public developed infrastructure.

The process to determine wildfire potential in this study was to investigate and decide what fuel models are present on a given parcel and evaluate mitigating circumstances to determine wildfire threat potential. These mitigating circumstances included both fire behavior potential and proximity to adjacent properties. The fire behavior considerations included true volatility of the actual vegetation on site, fuel continuity, topography and seasonality changes. Proximity considerations included adjacent wildland fuels, defensible space between the wildlands and infrastructure, and actual local fire history.

A fuel model designation is a set of vegetative characteristics present on a site. In 2005 the interagency National Wildfire Coordinating Group (NWCG) published a series of Standard Fire Behavior Fuel Models that are used nationwide and were used in this study. There are 40 standard fuel models in this comprehensive series. The models characterize the predicted fire behavior from the vegetation present on site. Variables include the total fuel loading present expressed in tons/acre; the volatility of the plants in both live, dead and seasonally variable conditions; the horizontal and vertical arrangement of these fuels; the continuity of the fuels present and the conditions under which the fuels will or not burn. While some models contain fuels that burn extremely hot and fast, others produce low intensity

¹ The primary investigator of this project, Robert (Bob) Panko, is currently active in his 51st year of wildland fire management. He has been fully qualified by the NWCG as an Incident Commander Type 2, an Operations Section Chief Type 2, as a Strategic Operational Planner and as a Prescribed Burn Boss Type 2. These qualifications are the results of significant training and a lifetime of wildland fire experience that began with his long career with the US National Park Service. Bob has been a federally qualified prescribed burn boss since 1995 and has managed wildland fires nationwide. From 2019 to 2022 he established a prescribed fire program for the Central Pine Barrens Commission in Long Island. He has authored prescribed burn plans that cover over 8000 acres in Long Island. Much of that work involved identifying the fuel models and wildland fire risks to the adjacent wildland / urban intermix.

wildfires. The differences of the risks involved are significant and predictable and are key to the expected intensity of a wildfire on those grounds.

In 2023, under contract with the Land Trust, the NY Natural Heritage Program completed a two year inventory of rare plants and animals and mapped the natural communities of the Land Trust parcels on Fishers Island. Using this as base line data, each parcel was visited and each of its vegetative communities were classed into one of the standardized NWCG fuel models. This established a relative wildfire hazard risk for each parcel. This study was used extensively to verify vegetation, overall fuel conditions observed and as reference to plant species present for additional fire behavior characteristics research.²

Using this system 18 of the 40 different fuel models were identified as present in the FMLT parcels.

In order to quantify wildfire risk present from these models and the observed mitigating circumstances, this study mimicked the nationally used wildfire warning levels as seen on Smokey Bear signs nationwide. Wildfire risk was defined as Low, Moderate, High, Very High or Extreme. **It is important to recognize that a designation of High fire risk is actually a “middle of the road” rating** with Very High and Extreme being above that. In this study none of the parcels were ranked as Very High or Extreme.

Fourteen of the fuel models found on Ferguson Museum Land Trust managed parcels are models that produce low to moderate intensity fires; won't burn, or will only burn under very extreme and very persistent weather conditions. Four models are present that tend to produce high flame lengths and rapid fire spread. Mostly those sites were limited to marshes with Phragmites Reed Grass (Fuel Model GS8) and Maritime Shrub/Scrub (Fuel Model SH6) along beach and shoreline bluff fringes. The risks presented by them vary from low (due to isolation) to moderate and in some cases locally high wildland fire risk. None of these high risk areas merited judgement as Very High or Extreme. The other models with high rates of spread are grass models found primarily in the Middle Farms Flats Grasslands which are managed being routinely mowed and/or prescribed burned. Consequently they were rated as low wildfire risk areas.

Many of the FMLT parcels are heavily invaded by non-native plants, and many of these non-natives make up the majority of the existing fuels loads. These non-natives, such as varieties of Honeysuckle, were present in both Timber Understory, Timber-Shrub and Shrub models. Considerable research was conducted to determine actually how burnable plants such as Honeysuckle found on site actually are. The results from various sources (written reports, on line materials such as the US Forest Service Fire Effects Information System and interviews with Northeastern US wildfire experts) are that these plants do not burn readily and only burn under significantly rare conditions. These are not inherently volatile plants. Since they make up the majority of fuels on site, the fire behavior expected for many of the selected models is “over-predicted”. The model predicts more intensive fire behavior than should be expected given the fuels actually present that do not burn readily under normal conditions.

I make this point with an example. In the Pine Barrens of Long Island (Fishers Island generally is included in this forest type) a timbered area with a “Heath” huckleberry/blueberry understory might be modeled as a Low Load, Humid Climate Shrub (SH4) with a predicted high rate of fire spread and moderate flame lengths. The Heath huckleberry/blueberry understory is a pyrogenic fuel with chemical content that burns readily even when green/live. Here in these FMLT parcels labeled as SH4, the understory is highly composed of Honeysuckle and other invasives which are resistant to burning. Although it is still ranked

² Appendix B of Fishers Island Biodiversity: Rare Species and Natural Communities of the Henry L. Ferguson Museum Land Trust, Gregory J. Edinger New York Natural Heritage Program

as an SH4 model (because of the physical structure of the fuel bed) the fire behavior in these parcels is likely over-predicted by the model except under very rare, extremely dry and windy and dormant plant conditions.

For the most part the FMLT parcels are surrounded by estates and properties with wide lawns and otherwise open areas. During this study we accessed FMLT properties walking across these lawns and roadways. This is defensible space that protects adjacent structures from wildfire risks. In all there is only one property, Easement 04 off Old Mallory Road, where some shrub clearing to create a defensible fuel break for a small outbuilding would be recommended if the landowner wishes to protect this structure in the event of a wildfire coming up from the ravine below.

There is little (or no) history of wildfire on Fishers Island. During the field work for this project no visible signs of past wildfires was found other than from the prescribed burning conducted over the years in Middle Farms Flats grasslands. There was no char on trees or other signs of past fires. Ken Edwards, a lifetime resident of Fishers Island and former Fishers Island Fire Department Fire Chief, could not recall any large wildfires or any incidents of Maritime Scrub burning in the coastal areas or other areas where it is present.

Many factors determine how a wildland tract of vegetation may burn. Vegetative fuels present is merely one factor. The amount of moisture present in wildland fuels on a daily basis determines whether or not fuels present are available to burn on a given day. The alignment of fire behavior factors such as wind, topography, temperature and humidity determine whether fire will burn passively or aggressively on any given day. Short and long term weather cycles impact these daily conditions creating conditions such as persistent drought that exacerbates these daily fuels conditions. Under extremely rare conditions almost any organic material in forests or range lands COULD burn, even mowed grass lawns. But these are rare events that come and go. The basic fuels remain on a tract of land and increase or decrease depending upon disturbances to that fuel bed.

Based on all of this, in summary, the results of this survey indicate that wildfire risks from the fuels present and expected for the next ten years on the FMLT parcels is low to moderate. The weather conditions / persistent drought experienced in the fall of 2024 in the Northeast US were unprecedented in recent history. Yet even under those conditions the likelihood of a large fast moving fire emanating from the FMLT parcels and posing a threat to adjacent private properties and infrastructure was extremely small.

Final Wildfire Risk Rating of 81 FMLT Parcels in this report

Wildfire Risk Level	# Parcels	Percent
Low Risk	67	84%
Moderate Risk	9	11%
High Risk	5	6%
Very High Risk	0	0%
Extreme Risk	0	0%

Summary of Findings:

The fuel models used are from the National Wildfire Coordinating Group (NWCG) official publication of the Standard Fire Behavior Fuel Models¹: These forty models are standardized nationwide. These models are categorized by Grass Fuel Models, Shrub Fuel Models, Timber Fuel Models, Slash Fuel Models and Non-Burnable Fuel Models. Of these models six Grass models, three Shrub models, four Timber models and four “Non-Burnable Models” were found in the FMLT parcels. That included a custom “Non-Burnable” model that was added to represent Willow Swamp / Pepperbush Swamp / Vineland and Shrubland thickets that are present in many Ferguson Museum Land Trust (FMLT) parcels.

These models include several models that are listed as Dynamic. This term describes that fuels will burn differently (or won’t burn) during different seasons; simply put, changes with seasons. An example of this on Fishers Island is the Middle Farms Flats grasslands. In mid to late spring dormant grass fuels are very capable of burning. By the end of May, however, these grasslands are in full vigor and are too green to burn. The “dynamic” fuels are labeled as such in the national set of Scott and Burgan models.

What is noteworthy here, however, is that several additional fuel models found in the FMLT parcels may also be dynamic due to presence of invasive plants. A commonly occurring fuel model here is Moderate Load, Humid Climate Shrub – SH3. On Fishers Island this shrub component is mostly made up of varieties of Honeysuckle and other invasives. SH3 is not a “dynamic” fuel model by definition, however it is felt that these will not burn when it is in the full vigor of summer / early fall, but will burn when it is in dormant stage in fall, winter and spring. Hence locally SH3 becomes a “dynamic” fuel model for us.

Most of the fuels in the FMLT parcels that were labeled as high potential wildfire risk include the vegetation group labeled as Maritime Scrub/Shrub. This is usually found in narrow bands upslope from beaches, on top of or on slopes of seaside bluffs or in steep, narrow ravines leading upslope from seaside beaches. It is a bit of a quandary deciding how likely it is that these Maritime Scrub/Shrub patches will burn in wildfire. First off, let it be said that anything organic can and will burn under extreme conditions. These scrub/shrub patches have plants in them that do burn readily; oaks, cherry, saltbush, poison ivy and others. But in interviews with local Fishers Island Fire Department Chiefs they have no history of burning here. I also interviewed multiple long term New England wildfire/prescribed fire experts. All said that these fuels were unlikely to burn unless under severe drought and with fire conditions (wind, sun, slope, temperature) in total perfect alignment. Research on the US Forest Service Fire Effects Information System indicated these “maritime scrub/shrub” forests were very long fire return interval ecosystem; 200 plus years between fires. So maybe that’s why nobody remembers them burning; our lifetimes are too short for this long fire return interval. But “maritime scrub/shrub” burned in the great fires in Maine in the early 19th century. I think that is what is here in Fishers Island and most of the NE US shorelines right now. They won’t burn very often, but one day they will burn. And then it will be centuries before they burn again.

¹ Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel’s Surface Fire Spread Model; 2005; Joe H. Scott and Robert E. Burgan; USDA Forest Service Gen. Tech. Rep. RMRS-GTR-153. 2005.

The following fuel models were found within the FMLT parcels:

FUEL MODEL	FUEL NAME	DESCRIPTION / CHARACTERISTICS
GR3	Low Load, Very Coarse, Humid Climate Grass (Dynamic)	The primary carrier of fire in GR3 is continuous, coarse, humid-climate grass. Grass and herb fuel load is relatively light; fuel bed depth is about 2 feet. This is the most common grass model found outside of the Middle Farm Flats grasslands in the FMLT parcels. This is a seasonally dynamic model that will not burn when fully green (generally mid –May through September).
GR6	Moderate Load, Humid Climate Grass (Dynamic)	The primary carrier of fire in GR6 is continuous humid-climate grass. This grass model makes up most of the eastern portion of the Middle Farm grasslands. This is a seasonally dynamic model that will not burn when fully green (generally mid –May through September).
GR8	High Load, Very Coarse, Humid Climate Grass (Dynamic)	In the FMLT parcels this model consists solely of Phragmites Reed Grass in marshes and pond margins. The primary carrier of fire in GR8 is continuous, very coarse, humid-climate grass. Load and depth are greater than GR6. Spread rate and flame length can be extreme if grass is fully cured. This is a seasonally dynamic model that will not burn when fully green (June-September).
GS2	Moderate Load, Dry Climate Grass-Shrub (Dynamic)	The primary carrier of fire in GS2 is grass and shrubs combined. Shrubs are 1 to 3 feet high, grass load is moderate. Spread rate is high; flame length moderate. In this study this model is only used for Salt Marsh and Salt Scrub habitats. Although a “dry climate” model, it was chosen as best match for these habitats in fuel loading / composition / continuity. This is a seasonally dynamic model that will not burn when fully green (June-September).
GS3	Moderate Load, Humid Climate Grass-Shrub (Dynamic)	The primary carrier of fire in GS3 is grass and shrubs combined. Moderate grass/shrub load, average grass/shrub depth less than 2 feet. Spread rate is high; flame length moderate. Moisture of extinction is high. This model is only found in the Middle Farm Flats grasslands with Sumac being the primary shrub. This is a seasonally dynamic model that will not burn when fully green (generally mid –May through September).
GS4	High Load, Humid Climate Grass-Shrub (Dynamic)	The primary carrier of fire in GS4 is grass and shrubs combined. Heavy grass/shrub load, depth greater than 2 feet. Spread rate high; flame length very high. This model was only found in a portion of the grassland in F54. This is a seasonally dynamic model that will not burn when fully green (June-September).
SH3	Moderate Load, Humid Climate Shrub	The primary carrier of fire in SH3 is woody shrubs and shrub litter. Moderate shrub load, possibly with pine / hardwood overstory or herbaceous fuel, fuel bed depth 2 to 3 feet. Spread rate is low; flame length low. This was a pretty common model in this study and was chosen to for numerous woodlands that are invaded by non-native shrubs and vines as an understory. Fire behavior is likely over-predicated by using this model, due to fire resistance of these non-natives. Although not listed as a “dynamic” model higher flame lengths and rates of spread may occur when these shrubs are dormant and the vines/shrubs now become available to burn.
SH4	Low Load, Humid Climate Timber-Shrub	The primary carrier of fire in SH4 is woody shrubs and shrub litter. Low to moderate shrub and litter load, possibly with pine overstory, fuel bed depth about 3 feet. Spread rate is high; flame length moderate. This model was selected in this study for sites that had higher fuel loading than SH3. Fire behavior is likely over-predicated in the FMLT parcel by using this model, due to resistance to fire of these non-natives. Although not listed as a “dynamic” model higher flame lengths and rates of spread may occur when these vines/shrubs are dormant and available to burn.
SH6	Low Load, Humid Climate Shrub	The primary carrier of fire in SH6 is woody shrubs and shrub litter. Dense shrubs, little or no herbaceous fuel, fuelbed depth about 2 feet. Spread rate is high; flame length high. This model was chosen in this study to represent areas of Maritime Shrub / Maritime Scrub which were mostly dense shrub patches of invasive Japanese Rose mixed with buckthorn, honeysuckle and some oak and cherry. SH6 is usually a hot burning, fast moving fuel model. In this case it is felt that these scrub patches will only burn under extremely dry conditions with strong winds in upslope alignment. ² This

² Interviews conducted with a variety of experienced Northeastern US wildland fire managers indicated that Maritime Shrub/Scrub patches were reluctant to burn unless driven by strong alignment with winds / fuels / slope and dry conditions. Ken Edwards, lifelong resident and former Fire Chief of the Fishers Island Fire Department, said he had never witnessed this Maritime Shrub/Scrub habitat burn. The US Forest Service Fire Effects Information System listed this habitat as a “stand replacement” ecotone with a fire return interval of 200 plus years (meaning it was expected to burn severely only once in a 200 year cycle).

		model was also used in some instances with very high shrub fuel loading other than Maritime Shrub/Scrub.
TL2	Low Load Broadleaf Litter	The primary carrier of fire in TL2 is broadleaf (hardwood) litter. Low load, compact broadleaf litter. Spread rate is very low; flame length very low. This model was found very infrequently in this study.
TL4	Small downed logs	This model was found only on one property Easement 06, where some timber had been cut for vista management and left on the ground. The primary carrier of fire in TL4 is moderate load of fine litter and coarse fuels. Includes small diameter downed logs and branches. Spread rate is low; flame length low.
TU2	Moderate Load, Humid Climate Timber-Shrub	This is the most prevalent fuel model found in this study, which is not unusual as it is a very common northeastern hardwood fuel model. The primary carrier of fire in TU2 is moderate litter load with shrub component. High moisture of extinction. Spread rate is moderate; flame length low.
TU3	Moderate Load, Humid Climate Timber-Grass-Shrub (Dynamic)	This model was found in only 3 sites in this study. The primary carrier of fire in TU3 is moderate forest litter with grass and shrub components. Extinction moisture is high. Spread rate is high; flame length moderate.
NB1	Non-burnable Urban/ Suburban areas with Grass Lawns.	Will not burn except during extreme drought. For grass lawn to carry fire it must be completely desiccated and dry. Grass lawns are used to create defensible space around structures in urban / suburban and rural settings.
NB3	Non-burnable Agriculture	Will not burn if maintained under agricultural use. The only site designated with this model is a small portion of the Ferguson Museum grounds F01.
NB4	Non-burnable Swamp / Marsh / Vineland	Will not burn except during extreme drought. This is not one of the "standard" 40 models, but was added to use in this study. This model reflects areas that will not carry fire except under extremely persistent dry conditions. These are generally willow and/or pepperbush marshes and vinelands often with standing water at the surface. Under almost all conditions these fuels would represent natural firebreaks for wildfires.
NB8	Nonburnable Lake / Open Water	Will not burn
NB9	Nonburnable Beach / Rock	Will not burn due to exposed rock / sand / gravel and extremely sparse fuels.

Table 1 Fuel Model Codes, Name and Description

Fuels and Risks by Contiguous Parcel Listing

The following are wildfire risk findings and maps listed using Contiguous Parcel groupings. Each page has a description of the fuels and risks, displays a map of the group of parcels, and has a table showing the relative wildfire risk for each parcel and a table of the fuel models present in this group of parcels.

The values of the wildfire risk ratings per parcel are coded as follows in Table 2

WILDFIRE RISK RATINGS		
<i>Table 2 Wildfire Risk Ratings</i>		
LOW	LOW	Surface fires with low flame lengths, moderate rate of spread and no spotting. Fires pose little or no threats to directly adjacent properties.
MODERATE	MODERATE	Surface fires with moderate flame lengths, moderate rate of spread & minimal spotting. Fires pose a minor threat to directly adjacent woodlands/grasslands or directly adjacent buildings and are easily protected.
HIGH	HIGH	Surface fires with high flame length (8' or more), high rate of spread (300'/hour or more). Sustained fire in the shrub layer with single tree torching. Spotting 20' or more. Threats exist only to immediately adjacent properties.
VERY HIGH	VERY HIGH	Surface fires with group torching, flame length very high, rate of spread very high and spotting 200' or more. Threats exist to adjacent properties.
EXTREME	EXTREME	Fire is being carried in shrub layer or tree crowns independent of surface fire. Flame lengths very high, rate of spread very high. Spotting ¼ mile or more creating significant threats to adjacent properties.

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Ken Edwards – Trustee



Jack Schneider – Land Trust Manager

