27 – LOCH ARBOUR VILLAGE

PLANNING TEAM AND PARTICIPATION

Name	Title	Participation
William Hulse	**OEM Coordinator/ Captain of Police**	**Point of Contact, Municipal Workshop #2**
Nicholas Dowling	Deputy OEM Coordinator/Detective	Reviewed municipal appendix and attended meetings with consultant

COMMUNITY PROFILE

Overview

The Village of Loch Arbour is roughly 2 blocks wide and 5 blocks long, for a total land area of just 0.10 square mile. With only 220 Residents as of the 2020 census, Loch Arbour has the smallest current population of any municipality in Monmouth County. Loch Arbour is traversed by the North Jersey Coastline, and residents can access the station at Allenhurst, less than a mile from the most distant part of the municipality. The NJ TRANSIT 832 and 837 bus routes also run through the Village.

Land Use, Development, & Growth

Source: MOV-IV Data, 2024

Land Use Type	Total Acres (2015)	Total Acres (2020)	Percent Change
Agriculture	-	-	-
Barren Land	5.3	5.7	8%
Forest	-	-	-
Urban	50.0	50.0	>0%
Water	18.6	18.0	-3%
Wetlands	0.0	0.3	>0%

Source: NJDEP Land Use/Land Cover data, 2015-2020

Recent Major Development and Infrastructure from 2020 to Present

None since the Main Street Bridge replacement in 2016 that falls in FEMA's 1% annual chance floodplain (NJFloodMapper).

Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years

None.

Demographics & Vulnerable Populations

This plan analyzed census-derived data on population trends and population age distributions to help illustrate potential vulnerability within the village. A population increase or decrease can illustrate potential hazard vulnerability through development pressures on the built environment, or through physical and social impacts of marked population loss. A community with a large share of population under age five may indicate vulnerabilities in hazard response, resource allocation, and evacuation – FEMA identifies that the pediatric population is disproportionately affected during disasters, and requires special consideration in categories of anatomy and physiology, psychological, and education vulnerabilities (FEMA, 2022, NLM, 2022). Individuals over age 65 are a growing share of the country's population and often represent the greatest share of deaths from extreme weather events and other natural disasters. A larger share of population over 65 may indicate local vulnerabilities to hazard events both before and after a disaster occurs – these populations may have mobility needs, uneven access to resources, and limited social networks that makes pre-disaster engagement challenging (FEMA, 2023).

The Village of Loch Arbor has a total estimated population of 220, of which an estimated 5% are under 5 years of age and 24.5% are over age 65. Loch Arbor experienced a population growth of an estimated 12.8% between the ACS survey

periods of 2013-2017 and 2018-2022. With an aging population making up nearly one-quarter of their total community, Loch Arbor may focus hazard mitigation efforts on those with robust messaging and engagement for older residents, evacuation plans inclusive of populations with mobility issues, and resilient networks for resource accessibility post-disaster. With a striking population growth of nearly thirteen percent, the village may face vulnerabilities related to development or redevelopment and potential densification of the built environment in hazard prone areas.

There are no areas of the Village which have been identified by CDRZ, CEJST, or OBC designation criteria.

Demographics Summary	
Total Population *(2018-2022 ACS 5-year Estimates)*	220
Population Change since 2017	12.8%
Percent of Population Age < 5	5.0%
Percent of Population > 65	24.5%

Source: 2018-2022 ACS 5-Year Estimates, 2013-2017 ACS 5-Year Estimates

HAZARD IDENTIFICATION

One of the first steps in developing a risk assessment is for participating municipalities to review and prioritize the hazards that can affect them. This was done based on how often a hazard has occurred, how significant effects have been in the past, the difficulty and cost of recovering from such events. Jurisdictions ranked the list of hazards as either high, medium, low, or no concern. The following include the Village's hazard ranking. The full risk assessment for each hazard is located in Section 4.0.

Hazard Ranking

High	Medium	Low
	Natural Hazards	
Hurricane/Tropical Storm	Extreme Temperature	Lightning
Coastal Erosion	Extreme Wind	Drought
Flood	Tornado	Earthquake
Storm Surge	Winter Storm	Wildfire
	Wave Action	
	Human-made Hazards	
	Cyber Attack	Civil Unrest
	Economic Disruption	Power Failure
	Terrorism	
	Pandemic	

The Village ranked Dam Failure and Landslide as N/A.

Hazard Ranking Explanation

Hurricanes, tropical storms, floods, coastal erosion, and storm surges continue to be the biggest concerns for the village. Among these, coastal erosion has seen an increase in its risk level. Significant erosion occurred on the village's beach in 2020, prompting town and state-funded improvements in 2022 to help mitigate the effects. Despite these efforts, erosion remains a persistent concern.

Significant Hazard Events Since Last Plan Update

In September 2023, Loch Arbour experienced significant flooding due to an unprecedented amount of rainfall over a short period. The rapid accumulation of water did not allow sufficient time to lower the level of Deal Lake, leading to the inundation. Although there was no substantial damage reported, the bulkhead was completely submerged underwater, highlighting the intensity of the flood.

Climate Change Impacts on Extent and Magnitude of Hazards

The Village of Loch Arbour is already facing significant risks from natural hazards such as hurricanes, tropical storms, floods, and coastal erosion. Climate change is expected to exacerbate these risks, increasing both their extent and magnitude. Rising sea levels and more frequent and intense storm events will likely lead to more severe coastal erosion and flooding. Looking at a map of FEMA BFE+3 indicates the Village may experience significantly more widespread flooding from large storms than just the regulatory floodplain.

RISK ASSESSMENT

National Flood Insurance Program (NFIP) statistics

Loch Arbour Village	
Initial FIRM	11/30/1973
Effective FIRM	03/15/1979
Number of Policies In-Force:	35
Total Losses:	99
Total Payments:	$3,667,207.74
Number of RL Properties:	16
Number of Mitigated RL Properties:	0
RL – Total Losses:	39
RL – Total Paid:	$720,809.86
Number of SRL Properties:	1
Number of Mitigated SRL Properties:	0
SRL – Total Losses:	4
SRL – Total Paid:	$93,012.98

Source: FEMA Policy and Loss Data, August 2024

Vulnerability of the Built Environment

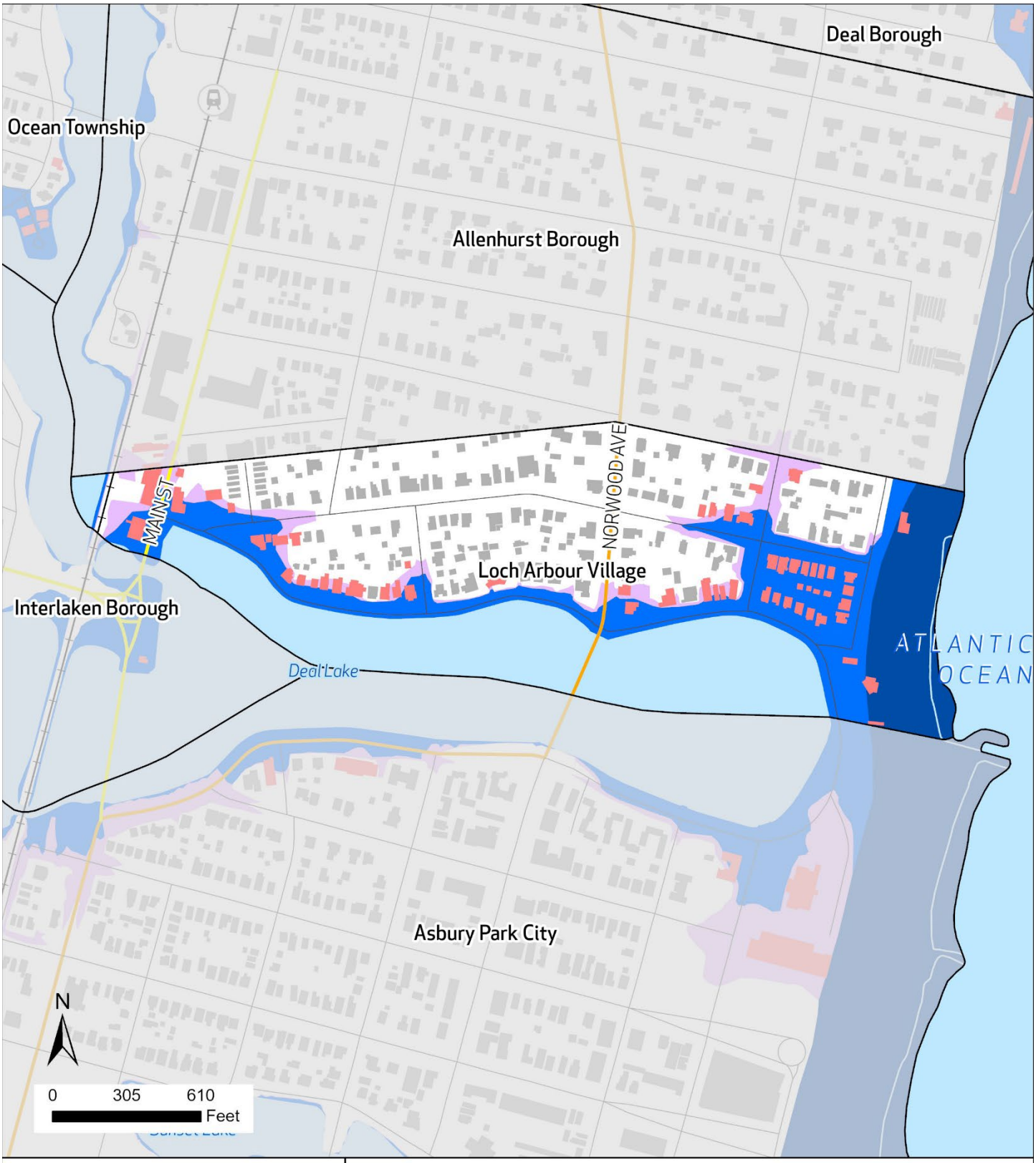
The Special Flood Hazard Area (SFHA) in the Borough of Loch Arbour is primarily located adjacent to the main waterbody of the borough, Deal Lake, especially the area between the Lake and the Atlantic Ocean. Approximately 52.1 percent of the total area of Loch Arbour lies within the 1% annual chance flood zone as defined by FEMA. An additional 5.5 percent of the area of the municipality is in the 0.2% annual chance flood zone.

About 87.8 percent of Loch Arbour is considered developed. Of the developed parcels of the town, 38.6 percent fall within the 1% annual chance flood zone and 12.1 percent are within the 0.2% annual chance flood zone. This illustrates that the developed area of the municipality is generally in line with overall flood risk.

	Percentage in the 1% Floodplain	Percentage in the 0.2% Floodplain	5 feet of Sea Level Rise
Developed Parcels	38.6%	12.1%	0.7%
Exposed Land Area	52.1%	5.5%	3.4%

Loch Arbour did not identify any critical facilities which function as community lifelines during the planning process, so it was not possible to analyze vulnerability of critical facilities.

	Number in the 1% Floodplain	Number in the 0.2% Floodplain	Number within 5 feet of Sea Level Rise
Community Lifelines and Critical Facilities	NA	NA	NA



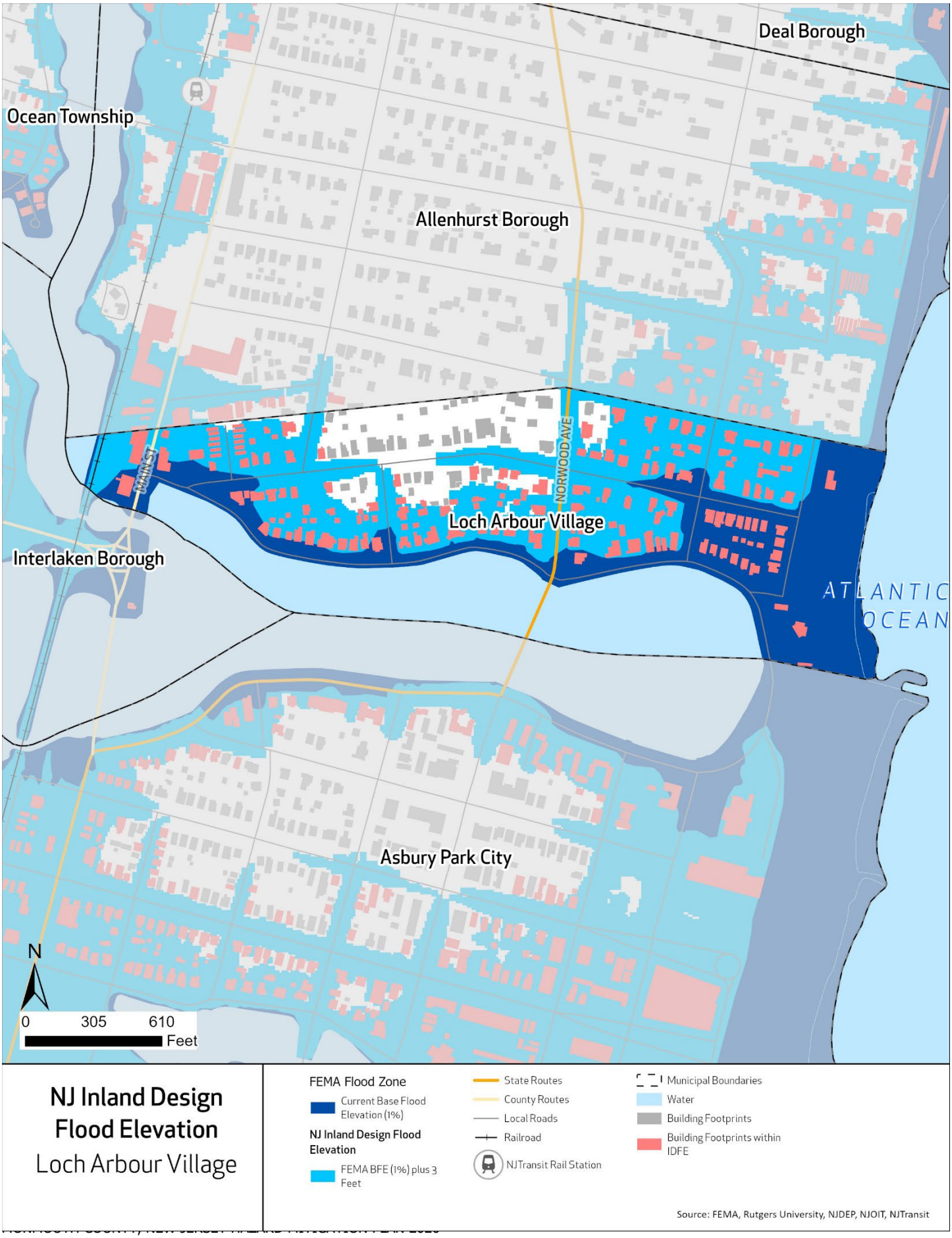
Flood Risk
Loch Arbour Village

FEMA Flood Zone
- 0.2% Annual Chance
- AE (1%)
- VE (1%)

- State Routes
- County Routes
- Local Roads
- Rail Lines

- Municipal Boundaries
- Building Footprints
- Building Footprints within Floodplain
- Water

Source: FEMA NJDEP, NJOIT, NJTransit


Deal Borough
Ocean Township
Allenhurst Borough
MAIN ST
NORWOOD AVE
Loch Arbour Village
Interlaken Borough
ATLANTIC OCEAN
Asbury Park City
N
0
305
610
Feet
NJ Inland Design Flood Elevation
Loch Arbour Village
FEMA Flood Zone
Current Base Flood Elevation (1%)
NJ Inland Design Flood Elevation
FEMA BFE (1%) plus 3 Feet
State Routes
County Routes
Local Roads
Railroad
NJTransit Rail Station
Municipal Boundaries
Water
Building Footprints
Building Footprints within IDFE
Source: FEMA, Rutgers University, NJDEP, NJOIT, NJTransit


Deal Borough
Ocean Township
Allenhurst Borough
MAIN ST
NORWOOD AVE
Loch Arbour Village
Interlaken Borough
Deal Lake
ATLANTIC OCEAN
Asbury Park City
N
0
305
610
Feet
Permanent Inundation Under Sea Level Rise (SLR) Scenarios
Loch Arbour Village
Area Inundated Under 2 Feet SLR
Area Inundated Under 3 Feet SLR
Area Inundated Under 5 Feet SLR
Interstate Highways
State Routes
County Routes
Local Roads
Rail Lines
Municipal Boundaries
Building Footprint
Water
Source: NOAA, NJDEP, NJOIT, NJTransit

Wildland Urban Interface (WUI) Classification

Loch Arbour Village

- High or Medium Density Housing
- Low or Very Low Density Housing
- No Housing
- State Routes
- County Routes
- Local Roads
- Rail Lines
- NJTransit Rail Station
- Municipal Boundaries
- Building Footprint
- Water

Source: USFS, NJDEP, NJOIT, NJTransit

CAPABILITY ASSESSMENT

Planning & Regulatory Capabilities

Loch Arbour Village has the following additional Planning & Regulatory capabilities:

Plan and Regulation	Yes	No	Date of last update	How does this capability support hazard mitigation?
Master Plan	X		4-1-2016	Integrating risk assessments, land use strategies, and resilient infrastructure planning to reduce vulnerabilities and enhance community preparedness.
Capital Improvement Plan	X		6-15-2024	Prioritize roads that act as a major travel way in case of an emergency.
Local Emergency Operations Plan/Continuity of Operations Plan	X		1-26-2025	
Floodplain Development Ordinance	X		6-30-2024	Restricts high-risk construction, promoting resilient building practices, and preserving natural floodplain functions to reduce flood damage and protect communities.
Floodplain Management Plan	x		6-30-2024	See Above.
Stormwater Management Ordinance	X		6-30-2024	Improving drainage systems, reducing flood risks, and enhancing water quality to protect infrastructure and communities from storm-related impacts.
Stormwater Management Plan	X		6-30-2024	See Above.
Watershed Management Plan				
Sheltering Plan	X		1-26-2025	
Evacuation Plan	X		1-26-2025	
Substantial Damage/Improved Structures Response	X		1-26-2025	
Repetitive Loss Plan		X		
Disaster Debris Management Plan		X		
Tracking elevation certificates and/or Letter of Map Change	X		1-1-2025	Floodplain manager reviews applications for conformance.
Post-Disaster Recovery Plan		X		
Current/recent redevelopment plans or studies		X		
Community Wildfire Protection Plan		X		
Climate Adaptation Plan		X		
Other Plans that discusses hazard mitigation		X		
Other ordinance and regulation that mitigate the impacts of natural hazards	X			In response to Superstorm Sandy, Loch Arbour adopted the "Flood Damage Prevention" chapter in the Borough Code to include updated definitions of flood terms, such as Advisory Base Flood Elevation (ABFE) and Substantial Damage. The Borough also updated the basis for establishing Special Flood Hazard Areas, adopted new standards for residential and nonresidential construction, and established that structures must be elevated above the Base Flood Elevation, ABFE, or as required by the Uniform Construction Code.

Administrative and Technical Capabilities

Loch Arbour Village has the following Administrative and Technical capabilities:

Position	Yes	No	Explanation
Floodplain Administrator	X		Leon S. Avakian Inc.
Grant Writer	X		Leon S. Avakian Inc.
Staff trained to support mitigation	X		Loch Arbour OEM
Existing mutual aid or technical assistance agreements to support hazard mitigation projects		X	
Non-governmental organizations/other partners that work with the municipality on mitigation projects		X	

Position	Yes	No	Explanation
Organizations that work with socially vulnerable or underserved populations		X	

Education and Outreach Capabilities

Loch Arbour Village has the following Education and Outreach capabilities:

Education & Outreach Capability	Yes	No	Explanation
Communicate natural and human-based hazards to the public	X		Nixle
StormReady		X	
Firewise USA		X	
Severe Weather Awareness Week		X	
Community Rating System (CRS)		X	

Financial Capabilities

Within the last five years, Loch Arbour Village has used the following financial capabilities to implement hazard mitigation activities:

Financial Capability	Yes	No	Explanation
FEMA BRIC		X	
FEMA FMA		X	
FEMA Public Assistance		X	
FEMA HMGP		X	
Non-FEMA Federal Funding Programs		X	
Other FEMA resources		X	
NJ Infrastructure Bank		X	
Other state municipal assistance or grant programs		X	
Evaluation process on the prioritization of risk reduction projects against other local activities		X	
Other ongoing efforts to build additional financial capabilities		X	

Additional Capability Assessment Information:

MITIGATION STRATEGY

Overview and Progress Since Last Plan

Since the 2021 plan update, The Village of Loch Arbour has prioritized enhancing flood resilience, strengthening emergency response capabilities, and improving critical infrastructure to mitigate natural hazard risks. Key completed actions include upgrading stormwater management systems, reinforcing evacuation routes, and improving backup power at essential facilities. Over the next five years, our focus will shift toward addressing the increasing impacts of climate change by implementing targeted roadway elevation projects, enhancing floodplain management strategies, and expanding public emergency preparedness initiatives. These efforts are designed to safeguard residents, minimize property damage, and ensure long-term community resilience.

Completed or Removed Actions

Action	Name	Description	Hazards Addressed	Priority	Responsible Party	Potential Funding	Cost Estimate	Timeline	Action Status	Notes
-	-	-	-	-	-	-	-	-	-	The Village has no completed or withdrawn actions since the previous plan update.

New and Ongoing Actions

Action	Name	Description	Hazards Addressed	Priority	Responsible Party	Potential Funding	Cost Estimate	Timeline	Action Status	Notes
27-01	Conduct a Study on the Need for Stormwater Basins and Construct New Infrastructure (if needed)	Deal Lake Commission is proposing: (1) a study to research the possibility of building several stormwater basins on DOT land; and (2) construction of stormwater basins.	Flood	Medium	Deal Lake Commission - Engineer, Environmental Consultant and Attorney	Municipal budget	$1,250,000	2 years	Ongoing	The reason for this action is to find and prioritize the needs to be addressed in high-risk areas of town. Addressing the problem areas will allow for better assistance in the case of an emergency.
27-02	Acquire the Beach Club Property and Protect the Shoreline with Dunes and Living Shorelines	Acquire Block 8 Lot 1 ; Block 7 Lots 1 & 2 and construct a sand dunes and living shorelines along the entire beach frontage.	Flood, Wave Action, Coastal Erosion, Nor'easter, Storm Surge	High	Village Engineer	FEMA HMA, The Nature Conservancy (TNC)	$3,000,000	2 years	Ongoing	With the Village having control over the beach club property, it will allow for full control over the projects that can be done on site. This will allow that no new major construction be proposed.
27-03	Construct an Automatic Tide Gate at Deal Lake	Deal Lake Commission is actively in the process of design for the development of automatic Tide Gate. The tide gate will be inserted within the 5' x 10' flume.	Flood	Medium	Deal Lake Commission - Engineer	FEMA HMA	$500,000	1 year	Ongoing	This will allow for better control of the tide gate. Allowing the control to be done remotely and not having someone on site during a storm event.

Action	Name	Description	Hazards Addressed	Priority	Responsible Party	Potential Funding	Cost Estimate	Timeline	Action Status	Notes
27-04	Acquire, elevate, or relocate buildings and infrastructure in flood prone areas, with a focus on Repetitive Loss (RL) and Severe Repetitive Loss (SRL) properties	Coordinate with residents to mitigate RL/SRL properties through structure elevation, demolition to open space, or other type of mitigation.	Flood, Nor'easter, Hurricane and Tropical Storm	High	Village and Property Owners	FEMA HMA	TBD	5 + years	Ongoing	This allows the Village to continue to follow state and federal guideline for construction in a flood hazard area. Following those guidelines will mitigate damage in a major flood event.
27-05	Raise the Bulkhead at Edgemont Drive	Raise the bulkhead at Edgemont Drive to protect homes.	Flooding	Mid	Village	FEMA	$3,000,000	5 Years	New	The raising of the bulkhead would creating a damming situation along the Village property to create more capacity in the lake.
27-06	Dredge Deal Lake	Remove excess sediment form identified choke points and reduce flood risks during heavy rainfall events. Deal Lake plays a crucial role in stormwater management for surrounding communities. Dredging increases its capacity to store and convey stormwater, reducing the risk of flooding during heavy rains and protecting local infrastructure. Regular dredging complements broader lake management strategies, such as shoreline restoration and vegetation control. It sets the stage for sustainable practices that maintain the lake's ecological and recreational value. Dredging removes sediments laden with nutrients, such as phosphorus and nitrogen, that contribute to algal	Flood, Nor'easter, Hurricane and Tropical Storm	High	Village, Deal Lake Commission	Municipal funds, Deal Lake Commission	$1,000,000	3 years	New	Dredging the lake will allow for more capacity in the lake. During a storm event, moving the water off of the road and into the body of water.

Action	Name	Description	Hazards Addressed	Priority	Responsible Party	Potential Funding	Cost Estimate	Timeline	Action Status	Notes
		blooms. These blooms deplete oxygen levels, harm aquatic life, and degrade the lake's water quality. Cleaner water supports biodiversity and recreational uses								
27-07	Construct strengthened bulkhead along with Interlaken Borough and City of Asbury Park	Strengthen flood resilience along Deal Lake with a fortified bulkhead. Collaboration with surrounding municipalities ensures cost-effectiveness and durability.	Flood, Nor'easter, Hurricane and Tropical Storm	High	Loch Arbour Village, Interlaken Borough, City of Asbury Park	FEMA HMA	1.5 Million	5 Years	New	The raising and completion of the bulkhead would creating a damming situation along the Village property to create more capacity in the lake.
27-08	Construction of Sand Dunes	The addition of sand dunes at vulnerable points along the Boroughs shoreline would allow for more resilience during a hurricane or major tidal event. The existing dunes will continue to be maintained under the DEP Permit, however, additional dunes will be considered.	Wave Action, Storm Surge, Flood, Nor'easter, Hurricane and Tropical Storm	Mid	Village	FEMA Village	$100,00	5 Years	New	Sand dunes act as the first line of defense in a severe tidal event. Creating more dunes will allow for more time for response.
27-09	Shoreline Flood Measures	Shoreline flood measures include a combination of structural defenses, such as seawalls, levees, and bulkheads, along with natural solutions like dune restoration, wetlands enhancement, and living shorelines to mitigate coastal flooding and erosion.	Flood, Nor'easter, Hurricane and Tropical Storm	Mid	Village	FEMA Village	$250,000	5 Years	New	