

CATTARAUGUS COUNTY
Multi-Jurisdictional Hazard Mitigation Plan

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List of Acronyms

DMA2K	Disaster Mitigation Act of 2000
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resources Conservation Services
NWS	National Weather Service
SEMO	State Emergency Management Office
E.S.	Emergency Services
CEO	Code Enforcement Officer

1.0 Executive Summary

In response to the Disaster Mitigation Act of 2000 (DMA2K), the Cattaraugus County Departments of Public Works and Emergency Services initiated this Multi-Jurisdictional Hazard Mitigation Plan. The goal of this plan was to examine the potential natural hazards that could affect Cattaraugus County, estimate what those potential impacts could be and develop and implement action items to mitigate impacts from the identified natural hazards.

Active participants in this Multi-Jurisdictional Hazard Mitigation Plan include:

- Cattaraugus County
- Towns of Allegany, Ashford, Carrollton, Coldspring, Conewango, Dayton, East Otto, Ellicottville, Farmersville, Franklinville, Freedom, Great Valley, Hinsdale, Humphrey, Ischua, Leon, Little Valley, Lyndon, Machias, Mansfield, Napoli, New Albion, Olean, Otto, Perrysburg, Persia, Portville, Randolph, Red House, Salamanca, South Valley and Yorkshire.
- Villages of Allegany, Cattaraugus, Delevan, East Randolph, Ellicottville, Franklinville, Gowanda, Limestone, Little Valley, Perrysburg, Portville, Randolph and South Dayton
- Cities of Olean and Salamanca
- Seneca Nation -- Allegany, Oil Springs, and Cattaraugus Reservations
- Southern Tier Extension Railroad Authority

A planning project group was formed consisting of representatives of various departments of county government. The formation of a planning guidance group was attempted. Initially it was to be formed of the project group plus representatives of the local jurisdictions (cities, villages, townships, and the Seneca Nation) included in Cattaraugus County. However, the participants cited lack of time and personnel to physically attend meetings. It was decided to send out a resolution authorizing the county to act on the individual participants' behalf. The county project committee was responsible for compiling all the information that the participants supplied through mailings, surveys, and telephone conversations into the plan. The Seneca Nation participated/ coordinated with the county and will provide its own hazard mitigation plan. Potential natural hazards were investigated and eleven were determined to have happened in Cattaraugus County in the past or had a strong likelihood they could happen in the future. These eleven natural hazards are:

- 1) Ice Storms
- 2) Severe Storms/ Wind
- 3) Flood
- 4) Winter Storm
- 5) Wildfire/Drought
- 6) Tornado
- 7) Ice Jam
- 8) Dam Failure
- 9) Earthquake
- 10) Landslide
- 11) Land Subsidence

Also included in the information gathering process were potential manmade hazards that include:

- 1) Civil Unrest
- 2) Hazardous Materials in Transit
- 3) Explosion
- 4) Terrorism – Biological
- 5) Epidemic
- 6) Hazardous Materials at Fixed Sites
- 7) Water Supply Contamination
- 8) Terrorism – Radiological
- 9) Terrorism – Chemical
- 10) Transportation Accident
- 11) Radiological – Fixed Site
- 12) Radiological - Transportation

A review of each municipality's profile of population, critical facilities, locations, assessed value of parcels in hazard zones, past histories, and a vulnerability analysis for each identified natural hazard was developed. Reviewing this analysis, problem statements were identified that indicated why vulnerability existed. From the problem statements, goals and objectives were identified to set the direction for how to mitigate the hazard vulnerability. The problem statements, goals and objectives led to the development of possible mitigation action items that could be implemented. At this time, state and local capability assessments were developed to assist in determining what agencies might be able to implement the action items. The action items were then analyzed and prioritized based on criteria established by the project group. From the prioritization and capability assessments, an implementation plan was developed that included who was responsible for what actions, how much it would cost, potential funding sources and proposed time frame to completion.

Throughout the planning process, the public was invited to participate. Through press releases of the planning activity, project group discussions at their meetings, the county web page posting and other venues, the public was constantly advised, updated and requested to participate in the process. After completion of the draft plan, public involvement was encouraged via press releases and posting on the county's web page to invite comments. A comment period was available to respond with written comments. Only one comment was made. The public comment, as well as SEMO/FEMA comments were incorporated into the final plan. When FEMA approved the final draft plan, it was then provided to the local jurisdictions for formal adoption. The final plan, with adoption resolutions (see Appendix J), will be submitted to SEMO/FEMA in compliance with DMA2K Legislation.

2.0 Plan Initiation - Cattaraugus County Multi-Jurisdictional Planning Process

The primary purpose of initiating the Multi-Jurisdictional Hazard Mitigation Plan for Cattaraugus County was to identify the community policies, actions, and tools for implementation over the long term that will result in a reduction in risk and potential for future losses from natural hazards within Cattaraugus County. Efforts were made to solicit public input during the planning process. As part of the planning process for the Multi-Jurisdictional Hazard Mitigation Plan, the following materials were reviewed by the project committee and Ed Koorse, Cattaraugus County Director of Emergency Services:

- Emergency Plans

- Flood Plans
- Flood Ordinances
- Watershed Plans
- Storm Water Management Plans
- FIS/FIRMS
- County HAZNY
- CEMP (see section 4.2 on page 25)
- Village of Gowanda Flood and Hazard Mitigation Plan (2/01)

The Multi-Jurisdictional Hazard Mitigation Plan was then tailored to incorporate the existing plans. Partners that had no emergency plans for their communities were encouraged and assisted by Cattaraugus County Emergency Services in preparing/updating their emergency plans and were informed of the other plans that their neighboring municipalities were using -- ie, Land Use Plans.

The Cattaraugus County Multi-Jurisdictional Mitigation Plan includes resources and information to assist county residents, local government, public and private sector organizations, and others interested in participating in planning for natural hazards. The mitigation plan provides a list of activities that may assist Cattaraugus County and local jurisdictions in reducing risk and preventing loss from future natural hazard events. The action items address multi-hazard issues, as well as activities for ice storms, severe storms, floods, winter storms, wildfires, tornadoes, dam failures and earthquake hazards.

2.1 Geographic Scope of the Mitigation Plan

Preparation of the Cattaraugus County Multi-Jurisdictional Hazard Mitigation Plan was in response to the Federal Disaster Mitigation Act of 2000, passed by Congress, and the subsequently developed rules, published in the Federal Register Notice, Part III 44 Parts 201 and 206 "Hazard Mitigation Planning and Hazard Mitigation Grant Program: Interim Final Rule" dated February 26, 2002.

This plan has been prepared under the local government of Cattaraugus County and has been prepared as a multi-jurisdictional plan. With cooperation from the local cities, towns, villages and the Seneca Nation, the plan will geographically include the entire county.

2.2 The Planning Team

The Cattaraugus County Multi-Jurisdictional Hazard Mitigation Action Plan is the result of a collaborative effort between Cattaraugus County, local municipalities, the private sector, Seneca Nation of Indians and regional and state organizations. A public workshop was held to include Cattaraugus County residents in plan development. A project committee guided the process of developing the plan. The following is a list of the members of the project committee, as well as their title and a brief description of their role/contribution.

- Cattaraugus County Department of Public Works
 - Mark C. Burr, P.E. Director of Engineering, County Hazard Mitigation Coordinator, head of the project team
 - Carmen Skiba, Administrative Assistant, plan organization, data acquisition
 - Crystal Gross, Microcomputer Specialist, GIS mapping, data acquisition, point of contact for participants
- Cattaraugus County Economic Development, Planning and Tourism

- Terry Martin, Chief Planner, data acquisition, future projections
- Cattaraugus County Emergency Services
 - Ed Koorse, Emergency Services Director & Fire Coordinator, review of participants existing emergency plans, integration into Multi-Jurisdictional Hazard Mitigation Plan
 - Vicki Hitchcock, Assistant to Director of Emergency Services, data acquisition
- Cattaraugus County Department of Real Property Services
 - Dan Martonis, Director of GIS for Cattaraugus County, data acquisition

2.3 Project Group Meetings

Initial letters were sent on March 20, 2003 by Stuart Lexer (former Emergency Services Director) to all Cattaraugus County municipal officials informing them of the mitigation plan. A meeting with these officials was held on December 17, 2003.

A public meeting was held on December 17, 2003 hosted by the Cattaraugus County Department of Public Works in conjunction with the New York State Emergency Management Office at the Cattaraugus County Center, 303 Court Street, Little Valley, NY 14755. This meeting was held for local officials (Appendix G for meeting sign-in sheet and mailing list) to discuss the hazard mitigation planning in regards to identifying hazards in jurisdictions within Cattaraugus County and how to implement a plan to mitigate these potential hazards.

Thomas Abbati from the New York State Emergency Management Office, Mitigation Branch, gave a brief over-view of the project. Charles Bliss of the Department of State presented correspondence regarding the adoption of a new Fire Prevention and Building Code, correspondence from Governor Pataki regarding the creation of a Code Enforcement Team for Disaster Response Mutual Aid Program, and a list of building code resources from the Department of State. Rebecca Anderson, Regional Floodplain Coordinator, gave a presentation on floodplain ordinances and floodplain maps. Darin Figurskey, meteorologist in charge of the NOAA Weather Service forecast office in Buffalo, N.Y. spoke of the help and data available from the NWS.

Attendees were provided a copy of Cattaraugus County's 2003 Hazard Analysis Report (HAZNY) and a Workbook for All Hazards Mitigation Plan. Those in attendance were asked to review, complete and return the Workbook for All Hazards Mitigation Plan no later than January 9, 2004. Those local officials who had no representation at this meeting were sent the information and the Workbook for All Hazards Mitigation Plan to complete and return. (Appendix G for mailing list)

All municipal representatives (Appendix G – Mailing list) within Cattaraugus County received a survey to rank potential hazards in their community. They were also invited to participate in future meetings, as well as provide their comments and concerns. The vast majority cited too little time and too few resources to help write the plan. Summaries of the completed surveys are shown in **Appendix A, Survey Nos. 1 and 2**. On March 25, 2004 a reminder notice was sent to all municipalities (Appendix G – Mailing list.)

On March 16, 2004 a representative from SEMO met with the Cattaraugus County Department of Public Works, Cattaraugus County Emergency Services and the Cattaraugus County Department of Economic Development, Planning and Tourism. This meeting was an informational meeting for the preparation of the hazard mitigation plan.

In continuing the process for developing a Multi-Jurisdictional Hazard Mitigation Plan, another meeting was held on May 14, 2004 with the project committee. This meeting included surveys

that were returned from municipalities ranking the local hazards, maps noting where the hazards are located, examples on how the Committee intends to extract values of property in and around hazardous areas and a discussion on and examples of "critical facilities".

On June 3rd, 2004, a third mailing was sent to every municipality within Cattaraugus County that identifies "critical facilities", listed them, and mapped them for the various municipalities. Participants were asked to review the identified critical facilities in their jurisdiction and supply any additional locations. Also included for each participant was a floodplain map of their jurisdiction for review and comment. (Appendix H – Floodplain maps by township)

At the June 16, 2004 Cattaraugus County Public Safety Committee meeting, a presentation was given to the committee on the hazard mitigation plan process and the current work status. Informational handouts were given to all Committee members.

On June 25, 2004 a SEMO representative met with Cattaraugus County DPW and Emergency Services. This meeting was to review comments from SEMO on the preliminary draft of this plan.

On July 20, 2004 a press release was sent to: Arcade Herald, The Chronicle, Franklinville Pennysaver, Gowanda Pennysaver, Springville Pennysaver, Empire Pennysaver, Special Effects, Salamanca Press and Olean Times Herald stating that the draft plan was available for download / review at the County website. The e-mail address, telephone number, and mailing address were provided for residents to ask questions or send comments. On August 25, 2004, a letter was also sent to each participant stating the same. Comments/questions were asked to be made by no later than Friday, September 3rd, 2004. Only one comment was received, that being from the City of Salamanca, requesting soil data for the Seneca Nation Allegany Reservation area. This data was then obtained and was incorporated into the final plan. See Figures 4 & 5.

On August 31, 2005 the Local Hazard Mitigation Plan Review Worksheet was received by the county and reviewed by the project committee.

On September 9, 2005, a letter with attachments was sent to each participating partner requesting more information on their floodplain administrator, and their local plans. Also included was a form letter resolution giving the county authority to act in the behalf of the participant's best interests. This was to address the issue of the small communities having too little resources and lacking personnel to help write the plan. **See Appendix F for copies of signed resolutions.**

On September 19, 2005 a meeting was held at the DPW facility that included the project committee and the Seneca Nation of Indians (Michele Keyes, Disaster Preparedness Coordinator). The Seneca Nation stated that they had been approved for their own grant to write a plan, but that they would still like to work hand-in-hand with the county.

On September 27, 2005 a mailing was sent out to all participants who have yet to send in their list of emergency plans, flood plans, etc. They were asked to respond by October 7, 2005.

On December 6, 2005, the Project Group and Mike Soper, Fire Chief of Carrollton, met to fill out the STAPLEE Evaluation Table and review/rank the action items.

On February 3, 2006, the second draft was sent to SEMO/FEMA for final review. A press release was issued February 6, 2006 to the same news outlets as before, stating the availability of the plan for review on the Web page, local libraries (Appendix G, page 54), and hard copy.

On July 10, 2006, FEMA approved plan pending participants' formal adoption.

On Sept. 15, 2006, the final plan and sample adoption resolution were sent to all participants.

Summary of Plan Development Collaboration

Date	Action	Participants/Results
3/20/03	Information letter sent out to all municipal jurisdictions in Cattaraugus County	<ul style="list-style-type: none"> Participants: Responded with letters of intent to participate with the county in a Multi-Jurisdictional Hazard Mitigation Plan
12/17/03	County Wide Hazard Mitigation Plan kickoff meeting	<ul style="list-style-type: none"> Participants (Agency/Organization only) <ul style="list-style-type: none"> Nations: Seneca Nation of Indians Federal Agencies include: National Weather Service State Departments include: NYSDEC, SEMO County Departments include: Administration Emergency Services Health Ec. Dev., Planning & Tourism Others include: Southern Tier West Regional Planning Soil & Water Local Municipalities include: <ul style="list-style-type: none"> Cities of: Olean Towns of: Allegany, Carrollton, Dayton, East Otto, Ellicottville, Great Valley, Humphrey, Leon, Little Valley, Napoli, New Albion, Olean, Perrysburg, Persia, Randolph, Salamanca, Yorkshire Villages of: Cattaraugus, Franklinville, Gowanda, Delevan, Little Valley Fire Departments include: Delevan, East Randolph, Gowanda, Limestone. Olean. Salamanca.
12/18/03	Information Package mailed to all municipalities	An informational packet was sent to all municipalities not having representation at the 12/17/03 kickoff meeting.
02/13/04	First survey sent	Surveys were sent to each municipality (Appendix G) and the Seneca Nation asking them to provide a contact person, rank their hazards, and provide demographic information.
03/16/04	SEMO meeting	Guidance Group met with Tom Abbati to discuss strategy.
03/25/04	Second survey sent	A second mailing was sent out to potential partners asking for historical information and geological location of problem areas.
05/14/04	Guidance Group meeting	Discussed returned partner surveys, defined “critical facilities”, and other matters.
06/03/04	Third survey sent	A third mailing was sent to potential partners which included flood maps of their municipality and a map of critical facilities in their jurisdiction for their comments and review. Also included was a job aid matrix requesting information on what sort of plans the municipality already had established.
06/25/04	SEMO meeting	Guidance Group met with Tom Abbati for his comments on the preliminary draft plan.
07/20/04	Press Release	Sent to local papers, stating availability of Draft for review and comment.
07/20/04	Plan sent	Draft 1 sent to SEMO /FEMA for review.
09/09/05	Fourth Mailing	Sent to all participants asking for required revisions as per FEMA review.
09/19/05	Meeting with Seneca Nation	A meeting was held at the DPW Facility that included the project committee and the Seneca Nation to discuss the progress of the Plan.
09/27/05	Fifth survey sent	Sent to all participants that have yet to list their plans.
12/16/05	STAPLEE	Project Group reviewed and ranked action items.
2/3/06	Plan sent	Draft 2 sent to SEMO/FEMA for final review.
2/6/06	Press Release	Draft 2 sent to local papers, libraries, and posted to the Web for public review
7/10/06	FEMA approval	FEMA notified SEMO of plan approval pending formal adoption of participants
9/15/06	Final plan sent	The final plan and sample adoption resolutions sent to all participants

Table 1

2.4 Involving the Public

Throughout the process a total of five mailings were sent to the local municipalities for discussion at their regular board meetings. The general public was involved by the announcement in multiple newspapers of the availability of the draft plan on the county website for review and comment.

3.0 Introduction to Cattaraugus County

3.1 Demographics

The County of Cattaraugus consists of 83,955 residents (2000 census) located in southwestern New York. The population of Cattaraugus County has decreased 0.3% since 1990 as compared to the 2000 census (**Table 2**). The land area of Cattaraugus County is scattered over 1,334 square miles. Population projections for Cattaraugus County are as follows:

TABLE NO. 2– CATTARAUGUS COUNTY POPULATION

YEAR	POPULATION	POPULATION INCREASE/DECREASE (%) FROM PREVIOUS 5-YEAR PERIOD
2000	83,955	
2005	83,881	-0.09%
2010	83,674	-0.25%
2015	83,359	-0.38%
2020	82,815	-0.65%
2025	81,989	-1.00%
2030	80,886	-1.35%

Table 2

Table. No. 3 shows the population in Cattaraugus County by municipality.

**CATTARAUGUS COUNTY
POPULATION BY MUNICIPALITY
1960-2000**

Table No. 3

Municipality	1960	1970	1980	1990	2000
Allegany	6483	7542	8619	8327	8230
Allegany Reservation	1059	1113	1243	1143	1099
Ashford	1490	1577	1922	2162	2223
Carrollton	1399	1507	1566	1555	1410
Cattaraugus Reservation	262	277	352	359	388
Cold Spring	580	638	708	732	751
Conewango	1162	1393	1578	1702	1732
Dayton	1931	2004	1981	1915	1945
East Otto	701	910	942	1003	1105
Ellicottville	1968	1779	1677	1607	1738
Farmersville	721	754	978	869	1028
Franklinville	3090	2847	3102	2968	3128
Freedom	1059	1355	1840	2018	2493
Great Valley	1408	1745	2014	2090	2145
Hinsdale	1538	1781	2182	2095	2270
Humphrey	415	405	529	580	721
Ischua	562	655	775	847	895
Leon	808	878	1055	1245	1380
Little Valley	1737	1838	1830	1881	1788
Lyndon	406	339	610	503	661
Machias	1390	1749	2508	2338	2482
Mansfield	632	605	784	724	800
Napoli	670	778	886	1102	1159
New Albion	1981	1988	2156	1978	2068
Oil Springs Reservation	0	5	4	3	2
Olean (City)	21868	19169	18207	16946	15347
Olean (Town)	2268	2211	2130	1999	2029
Otto	715	731	828	777	831
Perrysburg	1857	2236	2180	1838	1771
Persia	2756	2587	2442	2530	2512
Portville	3321	4252	4486	4397	3952
Randolph	2513	2621	2593	2613	2681
Red House	235	158	110	159	38
Salamanca (City)	8480	7877	6890	6566	6097
Salamanca (Town)	432	571	606	477	544
South Valley	205	164	212	281	302
Yorkshire	2012	2627	3620	3905	4210

Note: Village figures are included in Town figures

Table 3

Figure No. 1 maps the population data from the 2000 census.

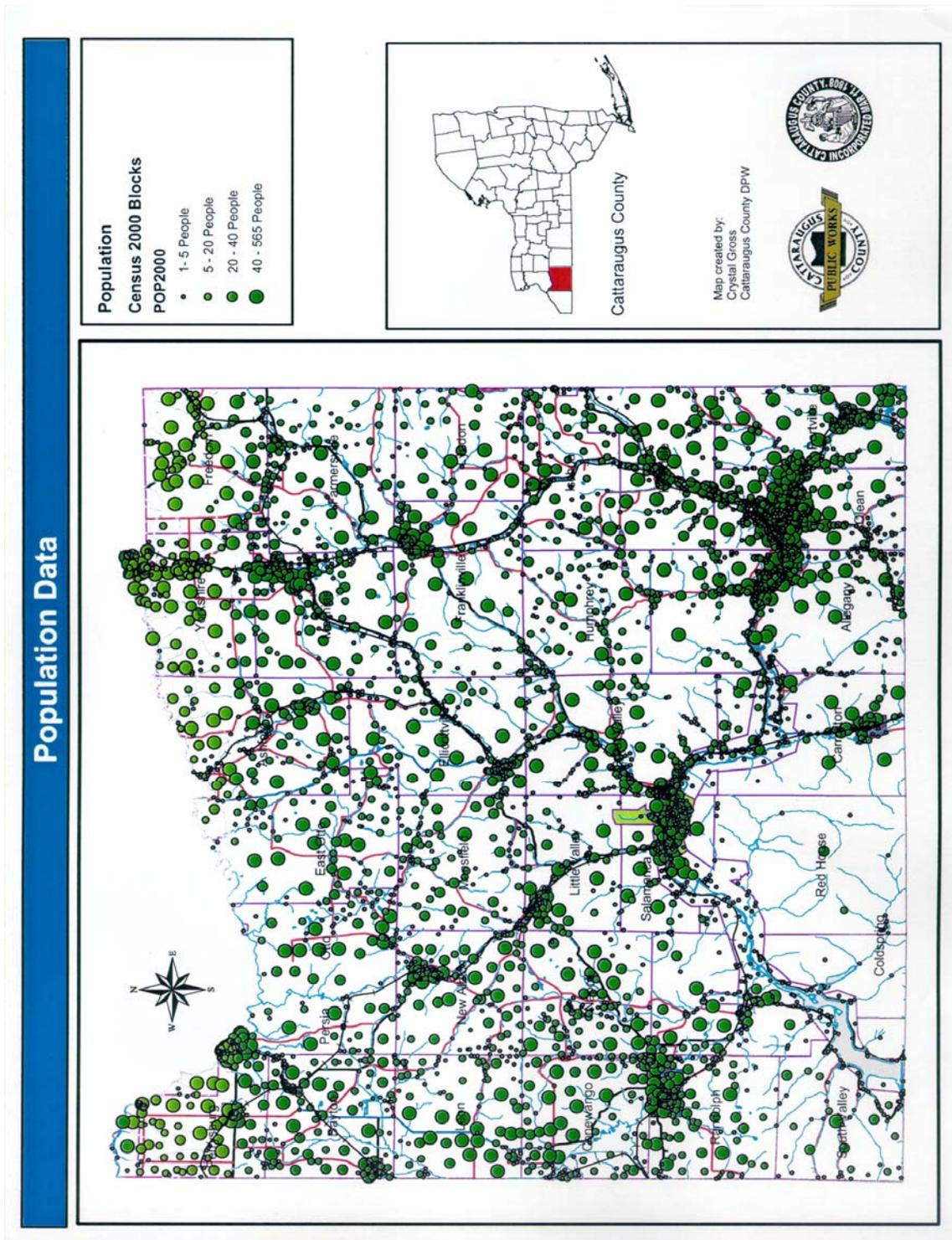


Figure 1

These projections were produced based on assumptions about future births, deaths, international migration and domestic migration. Projected numbers are based on an estimated population consistent with the most recent census.

There are 39,839 housing units in Cattaraugus County (2000 census). Cattaraugus County consists of 47 municipalities (32 towns, 13 villages, 2 cities and Seneca Nation of Indians – 3 reservations).

The three most populous areas in Cattaraugus County are the following:

The City of Olean is the most populous city in Cattaraugus County with its population for the 2000 census being 15,347. It contains a mix of residential, industrial, and commercial developments. There are 7,121 housing units in the City of Olean. The population density is estimated at 2,588 persons per square mile.

The Town of Allegany is the second most populous municipality in Cattaraugus County with its population for the 2000 census being 8,230. Total housing units in the Town of Allegany are 2,862. The Town of Allegany lies just 5 miles west of the City of Olean. The population density is estimated to be 115.6 persons per square mile.

The City of Salamanca is the only city in the United States that lies almost completely on an Indian Reservation with a population of 6,097. The Seneca Nation of Indians has a total population of over 7,200 enrolled members and holds title to three reservations (Allegany, Cattaraugus and Oil Springs) in New York with the Allegany Reservation encompassing the City of Salamanca. The Allegany State Park lies directly south of the City of Salamanca. There are 2,749 housing units in the City of Salamanca. Total population density is estimated to be 1,181 persons per square mile.

The Town of Ellicottville's population is average for Cattaraugus County with its population for the 2000 census being 1,738. Total housing units in the Town of Ellicottville are 2,097. The population density is estimated at 38.5 persons per square mile.

The Town of Red House is the least populous municipality in Cattaraugus County with its population for the 2000 census being 38. Total housing units in the Town of Red House are 25. The population density is estimated at 0.673 persons per square mile.

The Town of South Valley has the second to the least population in Cattaraugus County with 302 for the 2000 census. Total housing units in the Town of South Valley are 320. The population density is estimated at 8.14 persons per square mile.

3.2 Geographic Review

Cattaraugus County is located in Southwestern New York and borders Pennsylvania's northwestern counties of McKean, Warren and Potter, and is also centrally located between Buffalo, Cleveland, Niagara Falls (both sides of the Canadian border), Pittsburgh, and Toronto, Canada. New York City is about 7 1/2 driving hours away along Interstate 86 (formerly Route 17).

There are two very important interstate transportation corridors that intersect in the southern part of Cattaraugus County and form the "Southern Cross", Interstate 86 (east/west) and Route 219 (north/south). Interstate 86 runs east/west along the southern portion of New York State and continues on into New Jersey. US Highway 219 runs north to Buffalo, New York and south to Washington, DC and Florida. They intersect at Interstate 86 Exit 21 (Salamanca, New York) and Exit 23 (Bradford, Pennsylvania). New York State Highway 16, which also runs north/south, intersects with Interstate 86 at Exit 26 (Olean, New York).

General Location



Figure No. 2 depicts the geographic boundaries of Cattaraugus County.

Geographic Scope

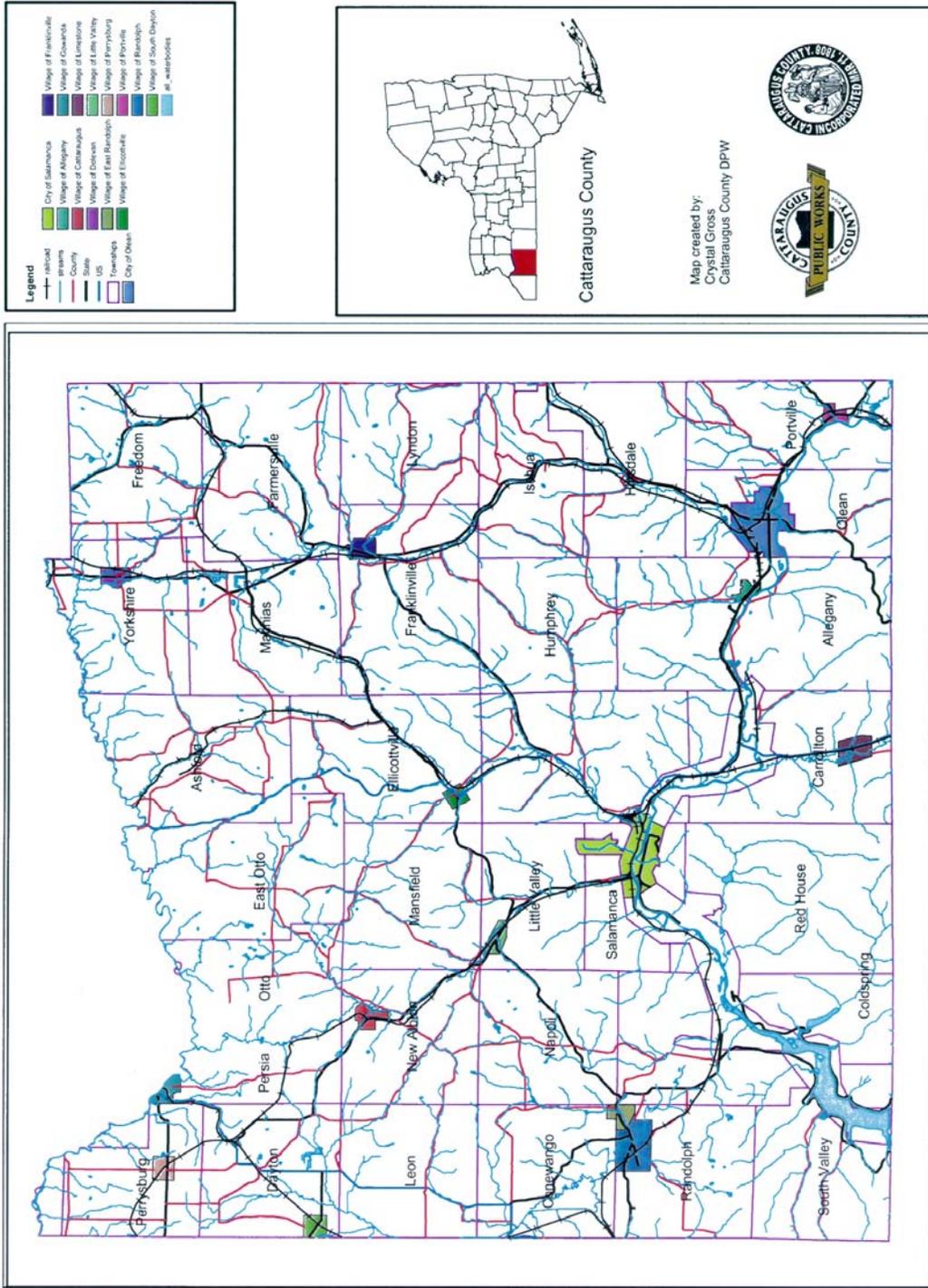


Figure 2

3.3 Major Water Bodies

Cattaraugus County has a continental divide oriented east-west. The lower 2/3 drains south to the Allegheny River. The upper 1/3 goes into the Cattaraugus Creek. **Figure 3** shows the locations of the drainage and sub drainage areas.

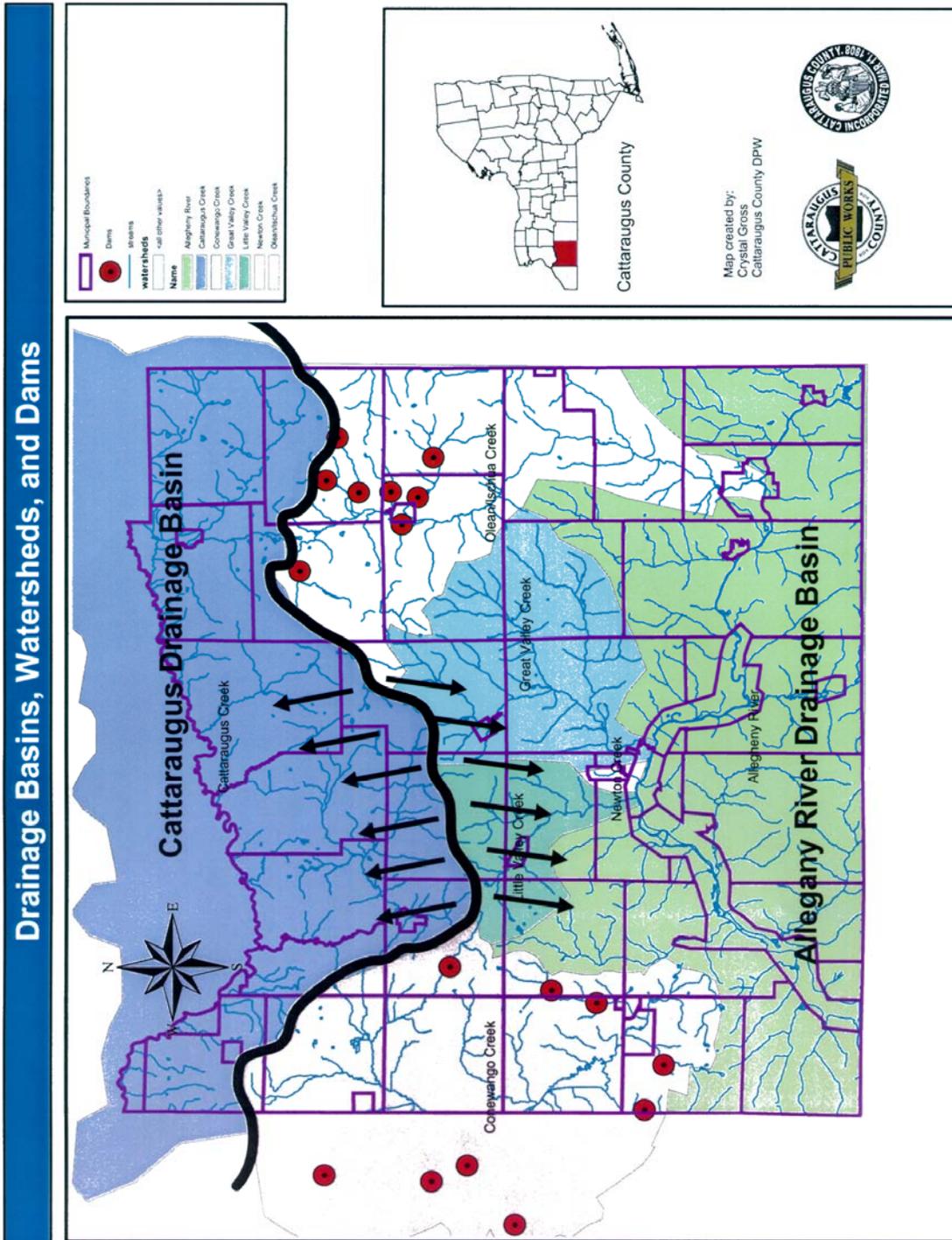


Figure 3

3.3.1 Allegheny River Drainage Basin

The Allegheny River enters Cattaraugus County from Pennsylvania in the southeast corner of the county. It makes a broad loop through the southern section and reaches its northern most point in the City of Salamanca. It leaves the county and New York State by way of the Allegheny Reservoir. This reservoir was created by the erection of the Kinzua Dam near Warren, Pennsylvania in the mid 1960's. Much of the residential areas in the villages of Portville and Allegany, and the cities of Olean and Salamanca are protected by levee structures of various ages. The rest of this river channel is free to occupy its historic floodplain. Many of the riverbanks are lined with large trees and erode very slowly. Private property and roadways adjacent to these riverbanks are threatened by erosion and are inundated by periodic floods. Major floods have overtopped these levee systems. The Seneca Nation of Indians' Allegany Reservation runs both sides of this river from the hamlet of Vandalia westerly to the Pennsylvania State Line. The drainage basin of this river covers almost all of the lower 2/3 of Cattaraugus County, which ultimately drains to the Ohio River, then to the Mississippi River.

3.3.2 Allegheny River Sub drainage Basin

Olean Creek is the largest tributary that enters the Allegheny River in New York State. It is also a source of drinking water for the City of Olean. Olean Creek is formed by the junction of Ischua Creek and Oil Creek. There are eight flood control impoundments that were constructed in the Ischua Creek Watershed in the 1960's. Two of these are recreational lakes. One of these, Harwood Lake, is maintained by the New York State Department of Environmental Conservation. Case Lake and the other six impoundments are maintained by Cattaraugus County. These impoundments have been a major relief to the historical flooding problem of this watershed. The silty-sandy stream banks along the main stems of these streams erode where the riparian protection has been removed. Tributaries draining the steeper terrain of this watershed are a major erosion concern, again due to the glacial gravel depositions.

Great Valley Creek and Little Valley Creek are the next two major tributaries as we head downstream. They enter the Allegheny River from the north on both sides of the City of Salamanca. Their watersheds are very similar to that of the Ischua Creek. The soils along these streams are more granular and less fertile. Much of the former agricultural lands have been abandoned to other uses. The riparian vegetation is regenerating itself along these sections. These streams do not have any flood impoundment on them as they did not have the same history of flood frequencies and intensities as that of the Ischua Creek.

Allegheny State Park contains 65,000 acres. This park is unique in the fact that it did not experience glaciation during the last two ice ages. The streams in this park are more stable than those in the adjacent surroundings. The raised elevation of this park experiences numerous, very intense storms and the lower reaches of the major tributaries are subject to erosion.

Cold Spring Creek enters the river at the headwaters of the Allegheny Reservoir about 1 ½ miles east of the hamlet of Steamburg. This stream drains a transitional area between the higher plateau region and the lower lake plain region. Erosion along this stream is most apparent where agricultural uses have removed the buffering riparian vegetation.

The Conewango Creek, a major tributary of the Allegheny River, whose confluence is near Warren, Pennsylvania, enters Cattaraugus County at a location approximately due west of the Village of Randolph. The main channel meanders northerly to nearly the Village of South Dayton before making a broad sweeping turn, eventually meandering southeasterly to the hamlet of New Albion. Much of its broad flat floodplain drained very slowly until the state constructed the

Conewango Drainage Ditch in 1896. This ditch runs northerly along the Cattaraugus-Chautauqua County line from Goodwins Landing to the Dredge Road by the Village of South Dayton. This project opened up this very fertile farmland. There are nine floodwater impoundments located in the headwaters of this creek. These are maintained by the Conewango Watershed Association and they have greatly reduced the severity of the floodings since their construction in the 1960's and 70's. Typically, the loss of the protective riparian vegetation primarily due to agricultural pursuits is the major contributor to stream bank erosion.

3.3.3 Cattaraugus Creek Drainage Basin

Cattaraugus Creek forms nearly the entire northern boundary of Cattaraugus County. Its headwaters originate in Wyoming County. Its tributaries drain a small section of northwestern Allegany County, a small section of northeastern Chautauqua County, the southern quarter of Erie County, and the northern third of Cattaraugus County. The subsoil in much of this drainage area consists of glacial deposits of sand, gravel and areas of unstable clays and silts. Steep stream gradients and the rapid runoff from any major storms make serious erosion a continuous problem in this watershed. Starting west of the Village of Arcade this creek cuts a major gorge along the county line. This gorge reaches depths of over 250 feet in the Springville area and over 500 feet in the area east of the Village of Gowanda known as the Zoar Valley Natural Scenic Area. From this gorge the creek flows westerly out through the Village of Gowanda and across the lake plain to Lake Erie. In addition to significant erosion, tributaries entering this creek along this gorge pick up massive amounts of woody debris from the heavily forested escarpment. The Cattaraugus County Creek drains into Lake Erie to Lake Ontario and finally to the St. Lawrence Seaway.

3.3.4 Cattaraugus Creek Sub Drainage Basins

Many of the larger tributaries of Cattaraugus Creek flow through more level areas of predominantly agricultural use. These areas are characterized by silty and coarse grain soils with medium and fine gravel streambeds containing few boulders. Where there is lack of adequate protection to the riparian zones of these streams, erosion is a major problem. These tributaries include the South Branch of Cattaraugus Creek, Mansfield Creek, Connoisarauley Creek, Buttermilk Creek, Elton Creek, the Clear Creek that runs through the Town of Freedom and many of the smaller tributaries.

3.4 Soils

Cattaraugus County has a wide variety of soil conditions that have an impact as to what type of damages could be anticipated from some natural hazard events. Many of the soils in the Cattaraugus Creek Basin are upland fines and are highly susceptible to erosion and landslides. This would be particular to the historic Thatcher Brook flooding damages and others along the Cattaraugus Creek headwaters.

These upland fine grained soils contribute to the unstable soils and landslides mostly located in the northern portion of the county. Landslides have taken place along Route 16 in the southeastern portion of the county. These soils are well drained, however, these areas have had landslides when they get super saturated. The northern portion of the county has various glacial tills. The southern portions of the county are comprised of residual and colluvial material. **Appendix B** contains a brief description of these soils.

General Soil Map

The general soil units have been grouped into general kinds of landscape. Each of the soil units are described on the following tables:

1. Areas dominated by very deep soils that do not have a fragipan and that formed in glacial till.

These soils make up about 10 percent of the county. They are on valley plains and uplands. They are dominantly very deep, well drained to somewhat poorly drained, and nearly level to very steep.

NAME	TEXTURE	FORMATION	COMMENTS	COVERAGE (% OF COUNTY)
Valois-Chautauqua-Busti	Medium	Loamy glacial till	Uplands	5%
Fremont-Schuyler	Medium to moderately fine	Acid glacial till	Uplands w/low content of lime	2%
Salamanca-Almond	Medium to moderately fine	Acid glacial till	Uplands w/low content of lime	3%

2. Areas dominated by very deep soils that have a fragipan and that formed in glacial till.

These soils make up 45 percent of the county. They are on upland and valley sides. They are dominantly very deep, somewhat poorly drained to moderately well drained, and nearly level to moderately steep.

NAME	TEXTURE	FORMATION	COMMENTS	COVERAGE (% OF COUNTY)
Erie-Langford	Medium	Loamy glacial till	Uplands, w/medium content of lime	5%
Volusia-Mardin	Medium	Loamy glacial till	Uplands, w/low content of lime	24%
Ischua-Yorkshire-Napoli	Medium	Loamy glacial till	Uplands, w/low content of lime	16%

3. Areas dominated by moderately deep soils and very deep soils that have a fragipan and that formed in glacial till.

These soils make up 1 percent of the county. They are on upland and valley sides. They are dominantly moderately deep and very deep, moderately well drained and somewhat poorly drained, and nearly level to very steep.

NAME	TEXTURE	FORMATION	COMMENTS	COVERAGE (% OF COUNTY)
Hornell-Orpark	Moderately fine	Acid glacial till	Uplands,w/low content of lime	1%

4. Areas dominated by very deep soils formed in glacial lake sediments

These soils make up about 6 percent of the county. They formed in clayey, silty, and sandy lake-laid deposits that generally have no rock fragments. They are mainly in the plains and valleys that dissect the upland plateau in the northern part of the county and in the major valleys in the western part of the county. In most areas the soils are drained to very poorly drained.

NAME	TEXTURE	FORMATION	COMMENTS	COVERAGE (% OF COUNTY)
Rhinebeck-Hudson-Niagara	Fine to medium	Glacial lake-laid deposits	On broad plains and dissected upland plateau w/medium content of lime	4%
Canandaigua-Swornville-Tonawanda	Medium	Glacial lake-laid deposits	Broad flats in valleys, w/medium content of lime	2%

5. Areas dominated by very deep soils formed in glacial till and glacial outwash.

These soils make up 10 percent of the county. They formed in morainic glacial till and gravelly outwash. They are moderately well drained to somewhat excessively drained. They are on valley terraces, outwash fans, and outwash plains throughout the county. The soils generally are nearly level to rolling, except along terrace fronts and in dissected hilly areas, where they range to very steep.

NAME	TEXTURE	FORMATION	COMMENTS	COVERAGE (% OF COUNTY)
Valois-Chenango-Castile	Medium and moderately coarse	Morainic glacial till and gravelly outwash	On moraines and outwash plains in valleys w/low content of lime	10%

6. Areas dominated by very deep soils formed in glacial outwash and recent alluvium.

These soils make up 4 percent of the county. They formed in glacial outwash, silty lake-laid deposits, and recent alluvium. They are mainly in the major valleys that dissect the upland plateau in the central and southern parts of the county. In most areas the soils are nearly level and gently sloping. They are well drained to somewhat poorly drained.

NAME	TEXTURE	FORMATION	COMMENTS	COVERAGE (% OF COUNTY)
Chenango-Pawling-Holderton	Well drained to somewhat poorly drained	Glacial outwash and recent alluvium	On alluvial floodplains, and in valleys	4%

7. Areas dominated by very deep soils and moderately deep soils that formed in residual and colluvial material.

These soils make up about 24 percent of the county. They formed in residual and colluvial materials that are very deep to bedrock and residual material that is less than 40 inches deep over siltstone, sandstone and shale bedrock. They are in the southern part of the county. The soils are dominantly well drained to somewhat poorly drained.

NAME	TEXTURE	FORMATION	COMMENTS	COVERAGE (% OF COUNTY)
Buchanan-Rayne-Portville	Moderately fine and medium	Colluvial and residual material	Uplands, w/low content of lime	9%
Carrollton-Kinzua-Onoville	Moderately fine and medium	Residual and colluvial material	Uplands, above elevations of 1800 ft., low content of lime	15%

The general soil map (**Figures 4 & 5**) shows broad areas that have a distinctive pattern of soils, relief, and drainage. The general soil map can be used to compare the suitability of large areas for general land uses.

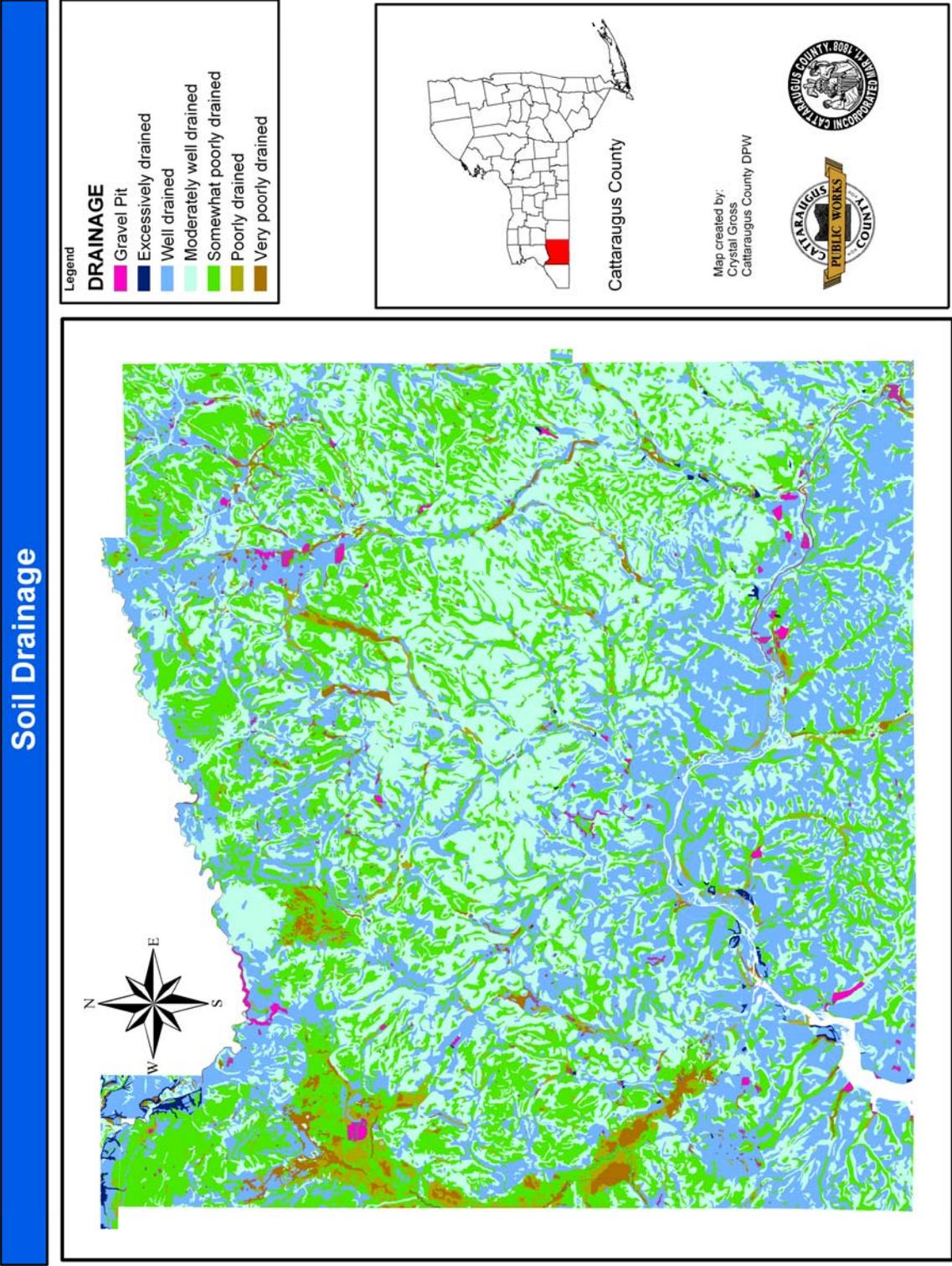


Figure 4

Soil by Hydrological Group

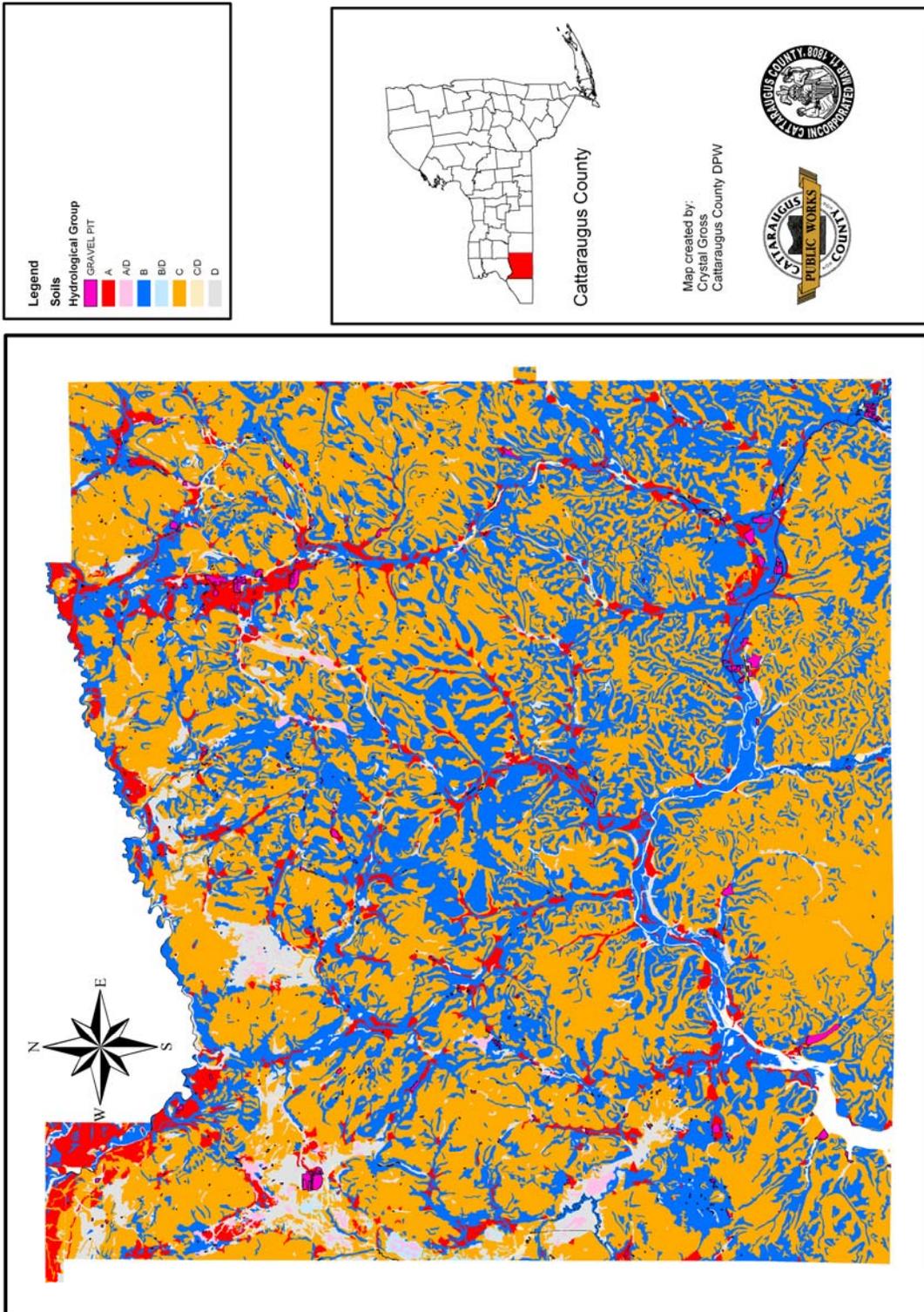


Figure 5

4.0 Natural Hazard Risk Assessment and Vulnerability Analysis and Loss Estimation

Several hazards have been identified in Cattaraugus County that are to be addressed in the Multi-Jurisdictional Hazard Mitigation Plan. These hazards were identified through an extensive process that utilized input from the following:

- Cattaraugus County Department of Planning, Economic Development and Tourism
- Public Input
- Local Jurisdictions Within Cattaraugus County
- Researching Past Disaster Declarations in the county
- Review of Current FIRMs
- Risk Assessments Completed by the Cattaraugus County Department of Public Works
- Sheriff's Department
- Multiple HAZNY's (1999 and 2003)

Upon completion of the research activities for these hazards, information was used to prioritize each natural hazard. Priority rankings were based on the probability that the hazard event would affect an area, the magnitude or severity of the hazard events, and the geographical extent that would be affected. The New York State SEMO HAZNY was used as a guide to prioritize the natural and manmade hazards.

The next step in the natural hazard risk assessment was to profile each of the natural hazards that were identified during the natural hazard identification step, with the focus being shifted to those natural hazards that are most likely to affect Cattaraugus County in the future. The natural hazard profile contains specific information about each identified natural hazard type, including definitions, a brief history of the natural hazard within Cattaraugus County, the natural hazards probability of occurrence, affected geographic extent, and anticipated magnitude.

The next step in conducting the natural hazard risk assessment was creating a community profile for Cattaraugus County. The community profile contains specific information concerning those assets within Cattaraugus County that are located within each identified natural hazard area. The final step is conducting the natural hazard events using the data gathered from the natural hazard and community profiling steps.

Once the natural hazard risk assessment was completed, the foundation of this plan began to take shape. This foundation includes information about the history of previous natural hazard events, the value of existing assets located in those natural hazard areas, and an analysis of risk to life, property, and the environment that could result from a future natural hazard event.

4.1 Local Jurisdiction Priorities

A total of 49 individual municipal jurisdictions (including Cattaraugus County) played an active role in the development of this mitigation plan. Each participating jurisdiction had a representative that attended meetings and/or was asked to provide specific information regarding previous natural hazard events in their respective jurisdiction. A Hazards Identification Survey (**Appendix A**) was then sent to all local jurisdictions (participants) within Cattaraugus County. They were asked to identify the hazards in their municipality and to identify which hazards present the highest risk.

A Risk Assessment Survey (**Appendix A**) was also sent to all participants within Cattaraugus County. They were asked to rank the top hazards for their community and profile each hazard.

Figure 6 - Removed

A critical facilities map (**Figure No. 7**) and floodplain map (**Figure No. 8**) were mailed to all local jurisdictions within Cattaraugus County. They were asked to review the critical facilities map and make any revisions as necessary.

Critical Facilities

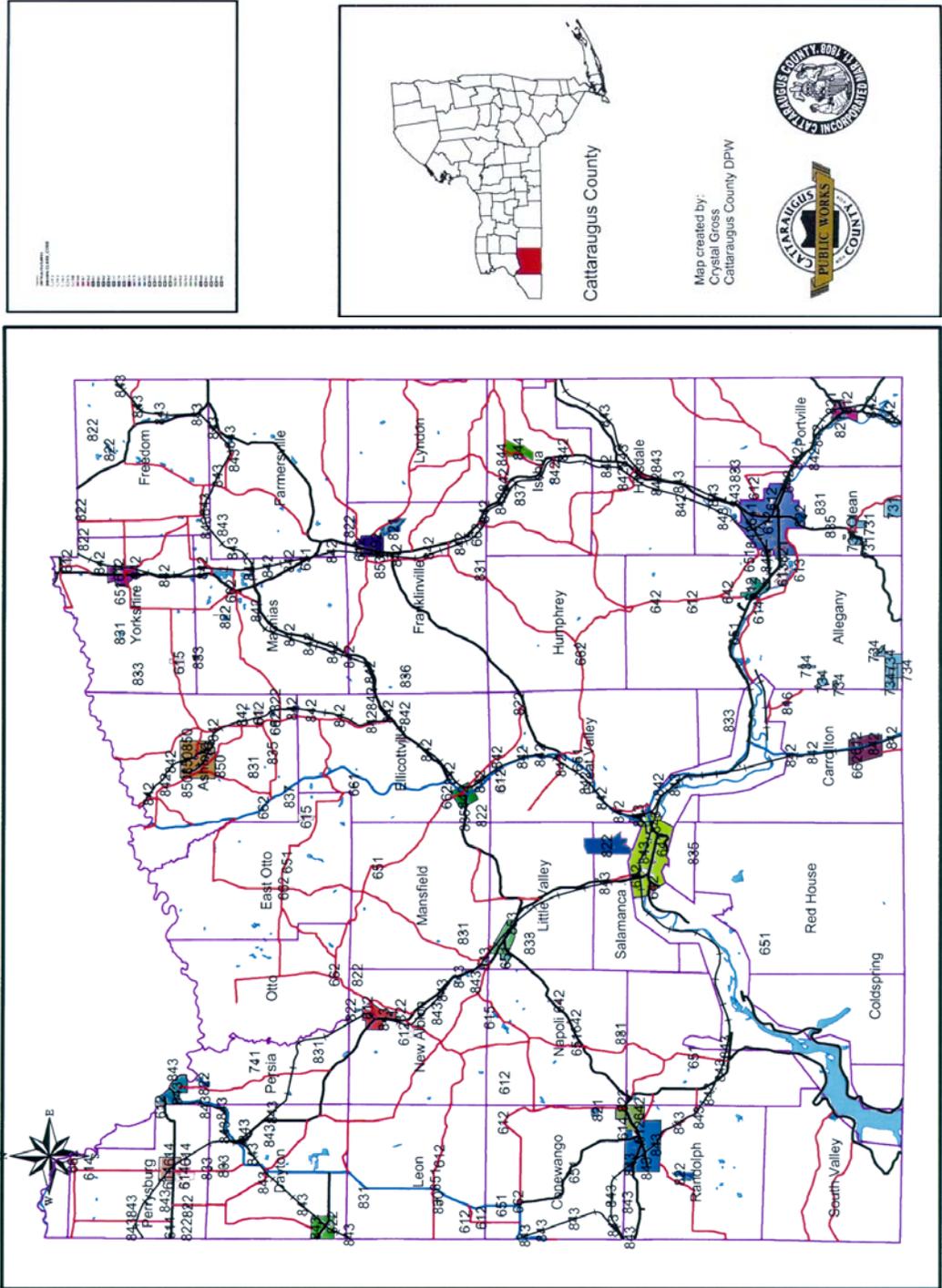


Figure 7

Floodplain

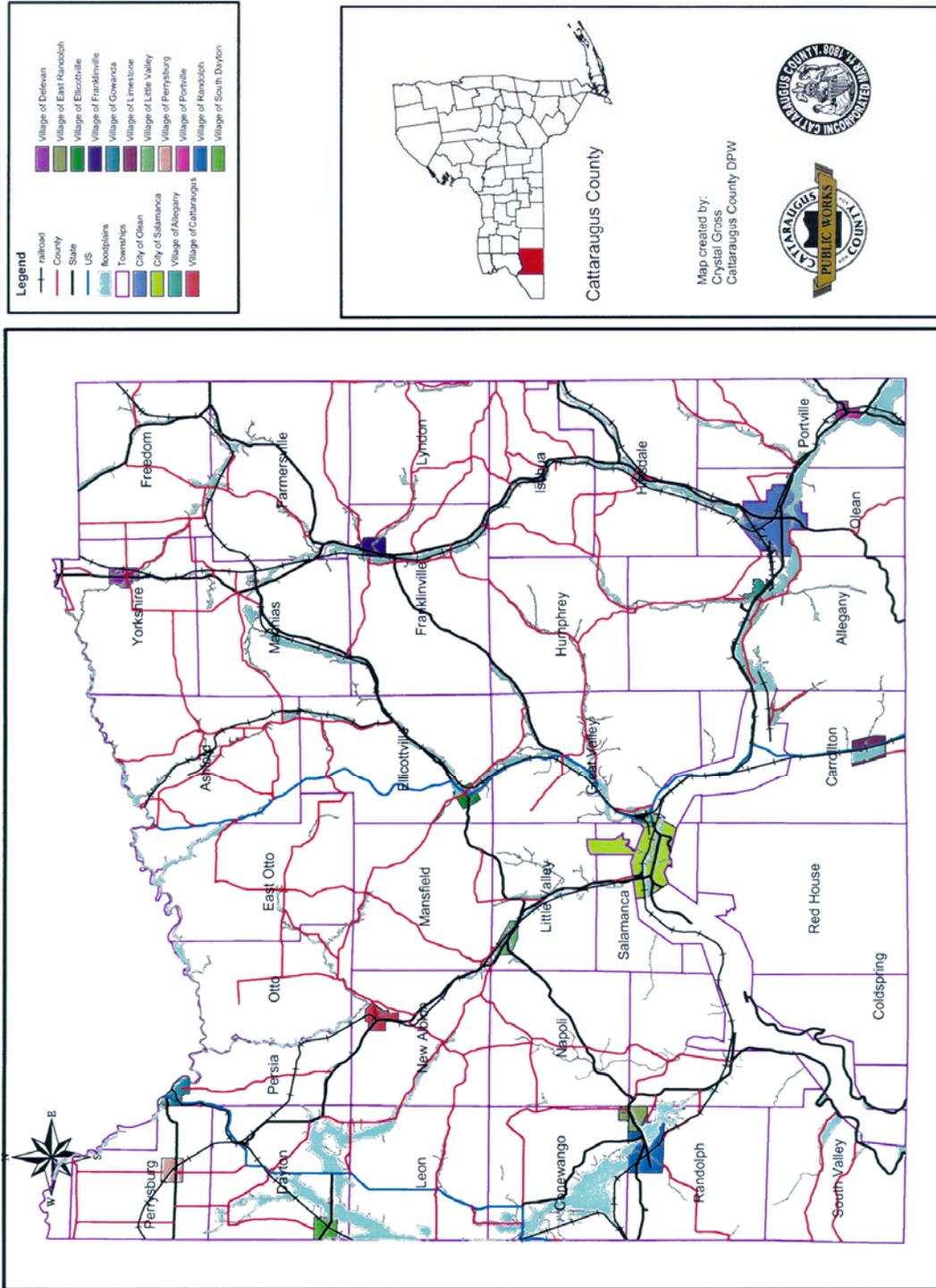


Figure 8

The majority of participants indicated the following natural hazards had previously occurred in their jurisdiction, and that there is a **large** probability that they could occur in the future:

- Ice Storm
- Severe Storm/Wind Storm/Hurricane Remnants
- Flood
- Winter Storm

The majority of participants indicated the following natural hazards either had not previously occurred or had rarely occurred in their jurisdiction, and that there is a **small** probability that they could occur in the future:

- Wildfire/Fire/Drought
- Tornado
- Ice Jam

A small percentage of participants indicated that the following natural hazards present a risk to their community, which would be considered limited area hazards:

- Landslides/Land Subsidence/Expansive Soils/Erosion
- Earthquakes
- Dam Failure

Findings from Cattaraugus County indicate the following natural hazards have not previously occurred in this jurisdiction, and that there is close to zero probability they will occur in the future:

- Extreme Temperatures
- Infestation
- Tsunami
- Coastal Storm

4.2 The Cattaraugus County Comprehensive Emergency Management Plan

The Cattaraugus County Comprehensive Emergency Management Plan was developed to enhance the county's ability to manage emergency/disaster situations. This plan was prepared by county officials working as a team in a planning process recommended by the New York State Emergency Management Office. This plan constitutes an integral part of a statewide emergency management program and contributes to its effectiveness. Authority to undertake this effort was provided by both Article 2-B of the State Executive Law and New York State Defense Emergency Act.

The development of this plan included an analysis of potential hazards that could affect the county and an assessment of the capabilities existing in the county to deal with potential hazards. This plan, when updated, will mention that the Cattaraugus County Multi-Jurisdictional Hazard Mitigation Plan exists and should be integrated into the Cattaraugus County Comprehensive Emergency Management Plan. It will be an Annex, page 176 of the CEMP.

The Group analyzed 21 manmade and natural hazards potentially affecting Cattaraugus County. Of these 21 hazards, 9 were natural hazards and are listed in order below:

- **Ice Storm**
- **Severe Storms**
- **Flood**
- **Winter Storm**
- **Wildfire**
- **Tornado**
- **Ice Jam**
- **Dam Failure**
- **Earthquake**

This was the basis for the county's hazard ranking with the local jurisdictions ranking their individual hazards independently from the county. Most of the local jurisdictions ranked their order differently with some having local hazards not identified in the county rankings.

4.3 Cattaraugus County Emergency Operations Guidelines

This guideline results from the recognition on the part of local government and state officials that a comprehensive emergency management guideline was needed to enhance Cattaraugus County's ability to manage emergency and disaster situations. The guideline was prepared by county officials working cooperatively with their state agency counterparts in a planning effort coordinated by the New York State Emergency Management Office. The county guidelines constitutes an integral part of a statewide emergency management program and contributes to its effectiveness. These guidelines, when updated, will mention that the Cattaraugus County Multi-Jurisdictional Hazard Mitigation Plan exists and should be integrated into the Cattaraugus County Emergency Operations Guidelines.

4.4 NCDC Database

The National Climatic Data Center (NCDC) maintains an on-line Storm Event Database of various weather events recorded for particular regions in the country. The database contains data that would affect Cattaraugus County including: flood, hail, lightning, tornadoes, precipitation, snow and ice, thunderstorms and windstorms, and extreme temperatures.

The Storm Event Database is updated when new data becomes available to the NCDC. The data is typically updated on a monthly basis and is usually 90-120 days behind a current month. All of the data contained in the Storm Event Database is received from the National Weather Service (NWS) and is made publicly available as soon as possible via the website, <http://www4.ncdc.noaa.gov/cgi-win/wwwcgi.dll?wwevent~storms>.

The on-line Storm Event Database contains summary information for 326 weather events affecting Cattaraugus County between June 13, 1957 and January 28, 2004. A table was prepared to show the history of each natural hazard event (**Appendix C**).

The data includes information on location, data, type, number of related injuries and deaths, and reported damage amounts for the following in Cattaraugus County:

- Thunderstorm/wind
- Tornado
- Hail
- High Winds
- Flash Flood
- Flood
- Snow Squall
- Heavy Snow
- Blizzard
- Winter Storm
- Excessive Snow
- Lightning

4.5 Federal Disasters

Listed below are events that have occurred since 1993 that have received a “Declaration of Disaster” by the President of the United States:

LIST OF DECLARATION OF DISASTERS

DATE	DISASTER	DISASTER NO.
March 1993	Blizzard	FEMA 3107-EM-NY
January 1996	Flood	FEMA 1095-DR-NY
June 1998	Flood	FEMA 1233-DR-NY
January 1999	Snow Emergency	FEMA 3136-EM-NY
May, June, July, August 2001	Flooding	FEMA 1335-DR-NY
November 2000	Snowstorm	FEMA 3157-EM-NY
December 2001	Snowstorm	FEMA 3170-EM-NY
September 11, 2001	Attack on America	FEMA 3191-DR-NY
July & August 2003	Severe Storms	FEMA 3186-EM-NY

Table 4 shows each Declaration of Disaster by municipality and damage amounts.

**FEDERAL DECLARED STORM EVENTS
CATTARAUGUS COUNTY**

	March 1993 Blizzard FEMA 3107-EM-NY	January 1996 Flood FEMA 1095-DR-NY	June 1998 Flood FEMA 1233-DR-NY	Jan. 1999 Snow Emerg. FEMA 3136-EM-NY	May, June, July, Aug. Flooding FEMA 1335-DR-NY
Cattaraugus Co. (Govern)	\$37,682.00	\$86,281.12	\$843,555.00	\$82,802.00	\$101,327.53
Town of Allegany	\$6,725.00	\$92,681.00	\$0.00	\$16,387.96	\$39,726.10
Village of Allegany	\$0.00	\$2,870.06	\$0.00	\$3,171.33	\$0.00
Town of Ashford	\$4,682.00	\$21,174.00	\$182,726.00	\$15,076.24	\$66,014.32
Town of Carrollton	\$1,045.00	\$26,420.00	\$0.00	\$5,655.27	\$0.00
Village of Cattaraugus	\$536.00	\$2,199.44	\$0.00	\$2,430.32	\$0.00
Town of Cold Spring	\$1,619.00	\$3,153.06	\$0.00	\$3,484.04	\$0.00
Town of Conewango	\$4,402.00	\$5,109.60	\$0.00	\$5,645.96	\$0.00
Town of Dayton	\$2,095.00	\$5,112.62	\$0.00	\$5,649.30	\$0.00
Village of Delevan	\$281.00	\$1,627.03	\$0.00	\$2,046.07	\$0.00
Town of East Otto	\$3,369.00	\$5,508.83	\$9,803.00	\$6,087.10	\$0.00
Village of E. Randolph	\$0.00	\$4,771.00	\$0.00	\$3,148.87	\$3,340.40
Town of Ellicottville	\$4,487.00	\$13,570.00	\$0.00	\$12,040.40	\$0.00
Village of Ellicottville	\$988.00	\$1,963.58	\$0.00	\$2,169.71	\$0.00
Town of Farmersville	\$4,392.00	\$11,977.00	\$0.00	\$5,195.33	\$28,416.16
Town of Franklinville	\$5,035.00	\$7,555.89	\$0.00	\$8,349.05	\$278,220.26
Village of Franklinville	\$0.00	\$1,777.83	\$0.00	\$1,964.45	\$0.00
Town of Freedom	\$0.00	\$0.00	\$0.00	\$0.00	\$62,847.03
Village of Gowanda	\$408.00	\$5,755.30	\$42,942.12	\$6,359.45	\$0.00
Gowanda (School)	\$0.00	\$1,131.49	\$12,194.00	\$1,250.27	\$0.00
Tri-County Hospital	\$0.00	\$0.00	\$7,362.00	\$0.00	\$0.00
Town of Great Valley	\$2,823.00	\$91,580.00	\$0.00	\$5,722.81	\$138,172.62
Town of Hinsdale	\$4,398.00	\$53,098.00	\$0.00	\$7,665.13	\$41,538.06
Hinsdale Fire Dept.	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Town of Humphrey	\$2,461.00	\$3,243.90	\$0.00	\$3,584.43	\$59,920.22
Town of Ischua	\$1,858.00	\$11,641.00	\$0.00	\$0.00	\$3,208.90
Ischua Fire Dept.	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Town of Leon	\$4,218.00	\$5,817.47	\$0.00	\$6,428.14	\$0.00
Village of Limestone	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Town of Little Valley	\$1,755.00	\$49,133.00	\$0.00	\$5,430.95	\$0.00
Village of Little Valley	\$0.00	\$49,133.00	\$0.00	\$4,903.63	\$0.00
Town of Lyndon	\$4,509.00	\$3,431.46	\$0.00	\$3,791.72	\$52,514.24
Town of Machias	\$4,583.00	\$8,390.73	\$0.00	\$9,271.52	\$0.00
Town of Mansfield	\$3,360.00	\$4,157.15	\$0.00	\$4,593.53	\$55,293.28
Town of Napoli	\$3,342.00	\$4,060.11	\$0.00	\$4,486.30	\$13,490.08
Town of New Albion	\$3,586.00	\$3,996.11	\$0.00	\$4,415.50	\$0.00
Town of Olean	\$2,461.00	\$12,555.00	\$0.00	\$0.00	\$0.00
City of Olean	\$2,046.00	\$5,507.02	\$0.00	\$6,085.11	\$0.00
Town of Otto	\$3,130.00	\$10,803.00	\$6,392.00	\$7,274.29	\$0.00
Town of Perrysburg	\$3,100.00	\$7,231.80	\$2,863.00	\$7,990.93	\$0.00
Village of Perrysburg	\$0.00	\$1,478.57	\$12,160.00	\$1,832.17	\$0.00
Town of Persia	\$1,406.00	\$2,497.33	\$18,454.00	\$2,759.48	\$0.00
Town of Portville	\$2,828.00	\$33,342.00	\$0.00	\$0.00	\$0.00
Village of Portville	\$321.00	\$0.00	\$0.00	\$0.00	\$0.00
Town of Randolph	\$4,544.00	\$4,107.83	\$0.00	\$4,539.04	\$0.00
Village of Randolph	\$669.00	\$1,710.53	\$0.00	\$1,890.08	\$0.00
Town of Red House	\$0.00	\$36,244.00	\$0.00	\$0.00	\$0.00
City of Salamanca	\$2,320.00	\$5,013.79	\$0.00	\$5,540.10	\$27,392.63
Town of Salamanca	\$0.00	\$2,103.36	\$0.00	\$2,324.16	\$5,020.44
Seneca Nation of Indians	\$0.00	\$1,748.87	\$0.00	****	\$1,319.50
Village of South Dayton	\$303.00	\$1,825.73	\$0.00	\$2,017.38	\$0.00
Town of South Valley	\$0.00	\$0.00	\$0.00	\$0.00	\$5,958.10
Town of Yorkshire	\$3,901.00	\$5,392.70	\$269,599.56	\$5,958.78	\$65,566.66
West Valley School	\$0.00	\$0.00	\$3,445.00	\$0.00	\$0.00
West Valley Fire Dept.	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Weston Mills Fire Dept.	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
DISASTER TOTALS	\$141,668.00	\$719,882.31	\$1,411,495.68	\$297,418.30	\$1,049,286.53

* Fire Department
 ** Listed as Randolph/East Randolph
 *** Olean Police Dept.
 **** To be handled by Bill Sherman (FEMA Indian Affairs)
 ***** Town and Fire Department

Table 4

**FEDERAL DECLARED STORM EVENTS
CATTARAUGUS COUNTY**

	Nov. 2000 Snowstorm FEMA 3157-EM-NY	Dec. 2001 Snowstorm FEMA 3170-EM-NY	9/11/2001* Attack on America FEMA 1391-DR-NY	July & August 2003 Severe Storms FEMA 1486-DR-NY	August Power Outage FEMA 3186-EM-NY
Cattaraugus Co. (Govern)	\$90,718.40	\$136,367.77	\$8,836.15	\$623,381.25	\$591.45
Town of Allegany	\$13,364.42	\$14,736.66	\$92.00	\$350,260.71	\$0.00
Village of Allegany	\$3,790.90	\$0.00	\$0.00	\$0.00	\$760.45
Town of Ashford	\$14,405.75	\$20,122.31	\$0.00	\$0.00	\$0.00
Town of Carrollton	\$0.00	\$0.00	\$0.00	\$21,077.58	\$0.00
Village of Cattaraugus	\$1,823.85	\$3,787.87	\$0.00	\$0.00	\$0.00
Town of Cold Spring	\$4,284.63	\$5,199.95	\$0.00	\$22,241.22	\$0.00
Town of Conewango	\$9,720.00	\$17,878.90	\$0.00	\$0.00	\$0.00
Town of Dayton	\$6,383.55	\$11,964.70	\$0.00	\$0.00	\$0.00
Village of Delevan	\$1,007.30	\$1,354.60	\$0.00	\$0.00	\$0.00
Town of East Otto	\$9,471.60	\$14,696.14	\$0.00	\$0.00	\$0.00
Village of E. Randolph	\$2,195.17	\$1,024.40	\$0.00	\$12,816.11	**
Town of Ellicottville	\$13,768.46	\$18,492.14	\$0.00	\$0.00	\$0.00
Village of Ellicottville	\$1,150.29	\$0.00	\$0.00	\$0.00	\$0.00
Town of Farmersville	\$7,487.58	\$12,102.61	\$0.00	\$19,245.90	\$0.00
Town of Franklinville	\$13,845.97	\$24,935.10	\$0.00	\$181,562.46	\$0.00
Village of Franklinville	\$2,485.30	\$3,881.03	\$0.00	\$0.00	\$0.00
Town of Freedom	\$4,355.04	\$0.00	\$0.00	\$0.00	\$0.00
Village of Gowanda	\$3,299.42	\$11,571.01	\$0.00	\$0.00	\$0.00
Gowanda (School)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Tri-County Hospital	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Town of Great Valley	\$0.00	\$0.00	\$46.00	\$0.00	\$0.00
Town of Hinsdale	\$13,503.81	\$7,395.66	\$46.00	\$252,566.10	\$0.00
Hinsdale Fire Dept.	\$0.00	\$0.00	\$0.00	\$10,484.84	\$0.00
Town of Humphrey	\$4,269.27	\$6,248.34	\$0.00	\$110,785.97	\$0.00
Town of Ischua	\$4,124.76	\$0.00	\$0.00	\$99,383.99	\$0.00
Ischua Fire Dept.	\$0.00	\$0.00	\$0.00	\$42,226.58	\$0.00
Town of Leon	\$7,281.08	\$14,834.86	\$46.00	\$0.00	\$0.00
Village of Limestone	\$0.00	\$0.00	\$46.00	\$12,697.81	\$0.00
Town of Little Valley	\$5,423.65	\$7,584.90	\$46.00	\$0.00	\$0.00
Village of Little Valley	\$3,520.49	\$5,145.88	\$0.00	\$0.00	\$0.00
Town of Lyndon	\$3,557.75	\$5,037.42	\$0.00	\$40,219.22	\$0.00
Town of Machias	\$6,160.22	\$16,519.94	\$46.00	\$0.00	\$0.00
Town of Mansfield	\$8,410.53	\$10,871.71	\$0.00	\$0.00	\$0.00
Town of Napoli	\$5,843.91	\$11,024.75	\$0.00	\$17,342.22	\$0.00
Town of New Albion	\$5,101.68	\$7,806.70	\$0.00	\$59,996.79	\$0.00
Town of Olean	\$0.00	\$0.00	\$46.00	\$97,059.03	*****
City of Olean	\$0.00	\$0.00	\$5,165.78	\$13,056.33	\$833.75
Town of Otto	\$6,720.18	\$12,700.43	\$1,138.00	\$0.00	\$0.00
Town of Perrysburg	\$6,576.48	\$10,069.01	\$0.00	\$1,968.00	\$0.00
Village of Perrysburg	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Town of Persia	\$3,233.09	\$6,395.76	\$0.00	\$0.00	\$0.00
Town of Portville	\$0.00	\$0.00	\$0.00	\$90,965.71	\$0.00
Village of Portville	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Town of Randolph	\$7,760.45	\$12,454.73	\$0.00	\$0.00	\$0.00
Village of Randolph	\$3,203.21	\$3,075.68	\$0.00	\$0.00	**
Town of Red House	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
City of Salamanca	\$7,084.97	\$9,814.90	\$0.00	\$0.00	\$0.00
Town of Salamanca	\$1,692.20	\$3,028.08	\$46.00	\$0.00	\$0.00
Seneca Nation of Indians	\$0.00	\$0.00	\$46.00	\$0.00	\$0.00
Village of South Dayton	\$1,205.60	\$3,386.32	\$0.00	\$0.00	\$0.00
Town of South Valley	\$1,939.21	\$3,011.50	\$0.00	\$21,091.18	\$0.00
Town of Yorkshire	\$7,400.74	\$17,595.70	\$46.00	\$0.00	\$0.00
West Valley School	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
West Valley Fire Dept.	\$0.00	\$0.00	\$1,230.00	\$0.00	\$0.00
Weston Mills Fire Dept.	<u>\$0.00</u>	<u>\$0.00</u>	<u>\$0.00</u>	<u>\$4,795.80</u>	<u>\$0.00</u>
DISASTER TOTALS	\$317,570.91	\$472,117.46	\$16,921.93	\$2,105,224.80	\$2,185.65

* Fire Department
 ** Listed as Randolph/East Randolph
 *** Olean Police Dept.
 **** To be handled by Bill Sherman (FEMA Indian Affairs)
 ***** Town and Fire Department

4.6 Natural Hazard Identification Summary

By collecting information from representatives from each jurisdiction, reviewing existing Cattaraugus County plans and reports, and gathering information from the NCDC Storm Event Database and Federal Disaster Database, the following natural hazards have been identified as those that could potentially affect Cattaraugus County. Future occurrences could possibly result in losses to Cattaraugus County assets or human life:

- Ice Storms
- Severe Storms/Wind
- Flood
- Winter Storm
- Wildfire/Drought
- Tornado
- Ice Jam
- Dam Failure
- Earthquake
- Landslide
- Land Subsidence

4.7 Natural Hazard Profiles / Vulnerability and Loss Estimation

Cattaraugus County has identified several hazards that are addressed in the Cattaraugus County's Multi-Jurisdictional Hazard Mitigation Plan. All the natural hazards that were identified in the previous subsection are those that **could** affect Cattaraugus County. The profiles contain information about the different aspects of each natural hazard that demonstrates how each could affect Cattaraugus County differently. Information presented includes: definitions, a brief history of the natural hazard within Cattaraugus County, the natural hazards probability of occurrence, affected geographic extent, and anticipated magnitude.

Every effort was made to assess the vulnerability and estimate the losses that might occur during one of the natural hazard events.

On July 1, 2003, the County of Cattaraugus, in conjunction with the New York State Emergency Management Office, conducted a hazard analysis using the automated program, Hazard Analysis (HAZNY). HAZNY was developed by the American Red Cross and the New York State Emergency Management Office.

HAZNY is an automated interactive spreadsheet that asks specific questions on potential hazards in a community and records and evaluates the responses to these questions. HAZNY also includes historical and expert data on selected hazards. HAZNY is designed specifically for groups, rather than individual use. The county assembled a group of 12 local, county and state officials to consider and discuss the questions and issues raised by the HAZNY program. Representatives from the State Emergency Management Office and the Finger Lakes Regional

Planning Council facilitated the meeting and recorded the results. The list of attendees for planning/review process is listed on the table below:

HAZNY PLANNING/REVIEW ATTENDEES

Mark Burr, Hazard Mitigation Coordinator	Cattaraugus County DPW
Crystal Gross	Cattaraugus County DPW
Barney Lee	Local Emergency Planning Committee
Joe Gaughn	Olean General Hospital
Michael Bechelli	Cattaraugus County EMS, Bioterrorism Coordinator
Lettie Chilson	West Valley Demonstration Project
Christopher Eckert	West Valley Demonstration Project
Julius Leone, Jr.	Chautauqua Co. EM
Richard Pollaro	Chautauqua County
Dennis Tobolski	Cattaraugus County Attorney
Dennis John	Cattaraugus County Undersheriff
Paul Wilson	SEMO
Douglas Winters	SEMO

Table 5

HAZNY rated each hazard based on the group’s assessment and assigned numerical values which are categorized below:

321 to 400	HIGH HAZARD
241 TO 320	MODERATELY HIGH HAZARD
161 TO 240	MODERATELY LOW HAZARD
44 TO 160	LOW HAZARD

The group rated the natural hazards as follows:

Ice Storm	271.8
Severe Storms	270.2
Flood	249.8
Winter Storm	245.2
Wildfire/Fire	232.5
Tornado	217.5
Ice Jam	217.2
Dam Failure	186.2
Earthquake	162.5

High Hazards

None of the natural hazards listed were rated as high hazards by the planning group.

Moderately High Hazards

Four natural hazards were determined to be moderately high hazards, which include Ice Storm, Severe Storm, Flood and Winter Storm.

Moderately Low Hazards

Five natural hazards were determined to be moderately low hazards, which include Wildfire/Fire, Tornado, Ice Jam, Dam Failure and Earthquake.

Low Hazards

None of the natural hazards listed were rated as low hazards.

Appendix D contains the 1999 and 2003 HAZNY results.

4.7.1 Ice Storms

Definition: A severe weather condition characterized by freezing precipitation forms a glaze on objects. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

HAZNY Analysis:

- Potential Impact: Large Region
- Cascade Effects: Highly Likely
- Frequency: Infrequent Event
- Onset: Several Hours Warning
- Hazard Duration: Four Days to One Week
- Recovery Time: More Than Two Weeks

History: According to the NCDC database ice storms have occurred twice in the last eight years (**Appendix C – History of Natural Hazard Events**), in one event accumulating up to ½” of ice. The Town of Humphrey reported a town wide ice storm in March of 1994 that knocked the electric out for four days. The Town of Randolph noted that they experience an ice storm at least once a year. There have been no recorded injuries or fatalities during these events; however, it must be noted that icy road conditions still exist during most winter weather conditions making sometimes treacherous conditions for the travelling public.

Probability of Occurrence: Based on information provided, the probability of a major ice storm occurring in Cattaraugus County is judged to be once every three years.

Geographic Extent: There are no topographic or other natural or man-made factors within Cattaraugus County that would predict geographic locations of future ice storms that may occur throughout the county.

Anticipated Magnitude: Defined as an event where more than ¼" of ice accumulates.

Anticipated Damage: It is a strongly possibility that critical facilities could be affected, causing power outages and loss of other critical services. Additional hazards that can be triggered by an

ice storm include transportation accidents, food and fuel shortages, utility disruption and communication losses. Normal emergency operations can be impeded. Since most ice storms take place during the frigid winter months, many people, especially the elderly and infirm, may be stranded without heat, electricity or access to needed services.

In the data reviewed for this hazard mitigation plan (**Appendix C**) the records of two winter storms were researched for Cattaraugus County. Of these two records, damage amount totals are approximately \$60,000.00, which would make an average event be approximately \$30,000. A worst case scenario -- such as the 1998 North County ice storm -- could vastly exceed that amount. That storm affected 320,000 people and totaled \$55,950,736 in damages. This works out to approximately \$15 per person. If a storm of similar magnitude were to occur in Cattaraugus County, population 83,955 (2000 Census data), at the same \$15/person, the total damage could exceed \$1.2 million, countywide.

4.7.2 Severe Storms/Wind Storm/Hurricane Remnants

Definition: Violent disturbance of the atmosphere accompanied by thunder, lightning, rain, snow or hail. Thunderstorms are often accompanied by gusty winds, heavy rain and occasional hail. Situated as it is, so far inland, Cattaraugus County has never experienced a true hurricane. In 1972, the remnants of Hurricane Agnes crossed our county and dumped torrential rains, causing extensive flooding and wind damage.

HAZNY Analysis:

- Potential Impact: Large Region
- Cascade Effects: Highly Likely
- Frequency: Regular Event
- Onset: No Warning
- Hazard Duration: Less Than One Day
- Recovery Time: Three Days to One Week

History: There are 146 records for severe storms that have occurred in Cattaraugus County in the data reviewed for this hazard mitigation plan (**Appendix C - Table 4b – History of Natural Hazard Events**). This data also shows that single storms have previously been reported as affecting multiple sites within the county as well as multiple sites throughout the state. **Figures 9, 10 and 11** depict hail and wind events. **Figure 12** shows the wind zones in the United States. The Village of South Dayton has recorded 50 mph sustained winds lasting 2-3 hours.

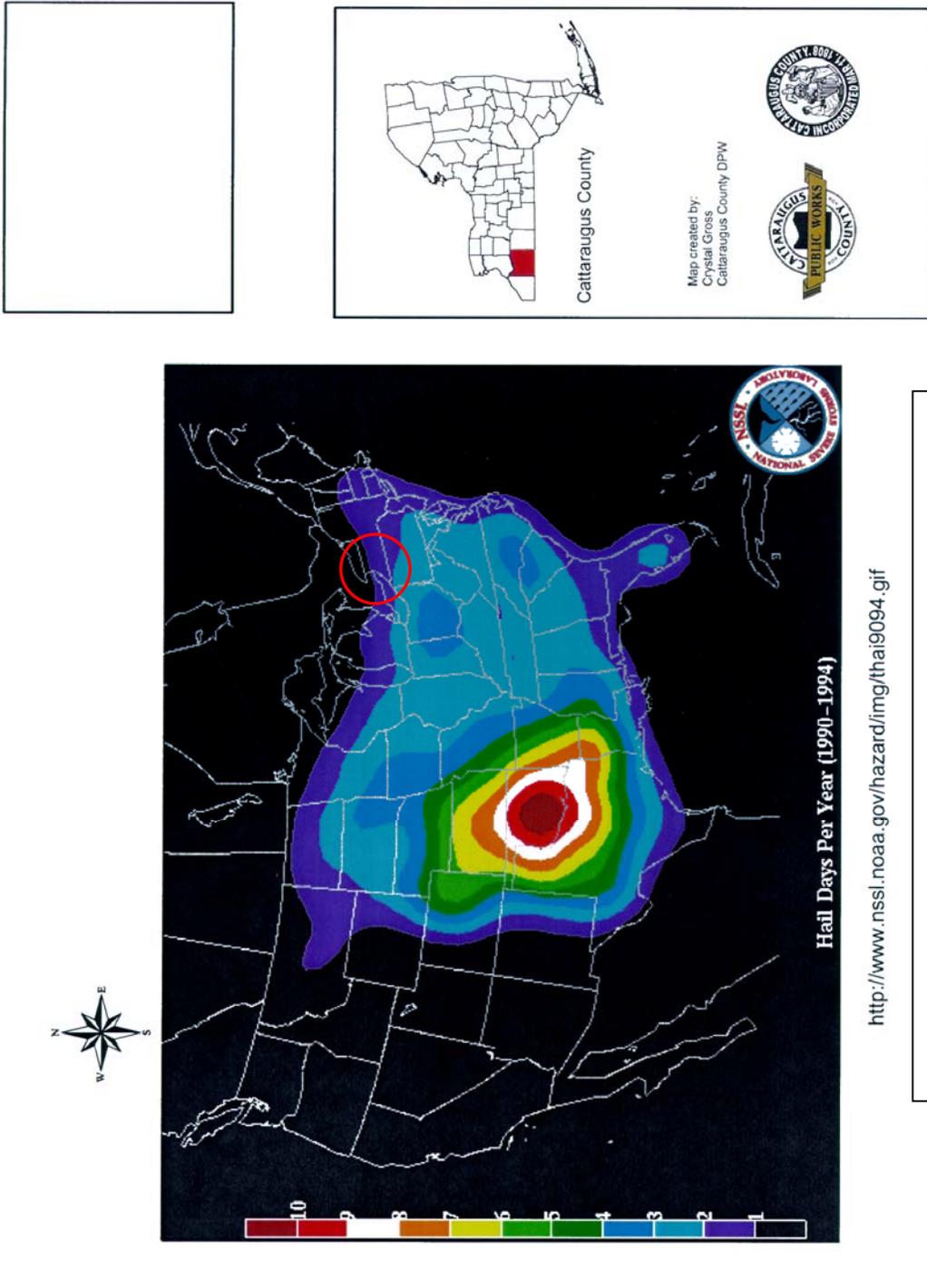
Probability of Occurrence: The entire county is vulnerable to damage from thunderstorms, hail or wind. Several villages reported that their old growth trees are extremely vulnerable to sudden, violent wind gusts. Those most at risk from lightning are people who are outdoors, especially under or near tall trees, in or on water, and on or near hilltops. June, July and August seem to be more prone to severe weather events, with an estimated average of severe storm events occurring at an estimated average of seven times per year. Hail event probability is two days per year based on Figure 9. Wind event is 4 - 5 days per year based on Figure 11.

Geographic Extent: Cattaraugus County lies at the western edge of the Allegheny plateau area. As storm fronts reach these increased elevations, greater amounts of rainfall and winds are experienced. Many times these storm events are concentrated in isolated watersheds, causing flash flooding, while the adjacent watersheds experience little or no flooding. The locations within the county vary and are randomly disbursed.

Anticipated Magnitude: Magnitude of a hail event is when hail larger than ¾ inch falls. Magnitude of a wind event is 50 kilometers per hour.

Anticipated Damages: It is reported in the NCDC Database that there are 146 records of severe storms that affected Cattaraugus County occurring from June 1957 to July 2003. The average damage per event, for which there was a dollar amount listed, was \$22,000. There was a report of two injuries from a single event that occurred from a lightning strike in September 2001. There were 79 events with no damage estimates. In July and August of 2003 a severe storm was declared a federal disaster with damages in the amount of \$2,100,000. This disaster declaration is also listed under flood events in the NCDC Database with damages of \$1,000,000.

Hail Events 1990 - 1994



<http://www.nssl.noaa.gov/hazard/img/thai9094.gif>

Two hail days per year can be expected. A hail day is defined as when hail larger than 3/4 inch in diameter falls.

Figure 9

Hail Events 1995 - 1999

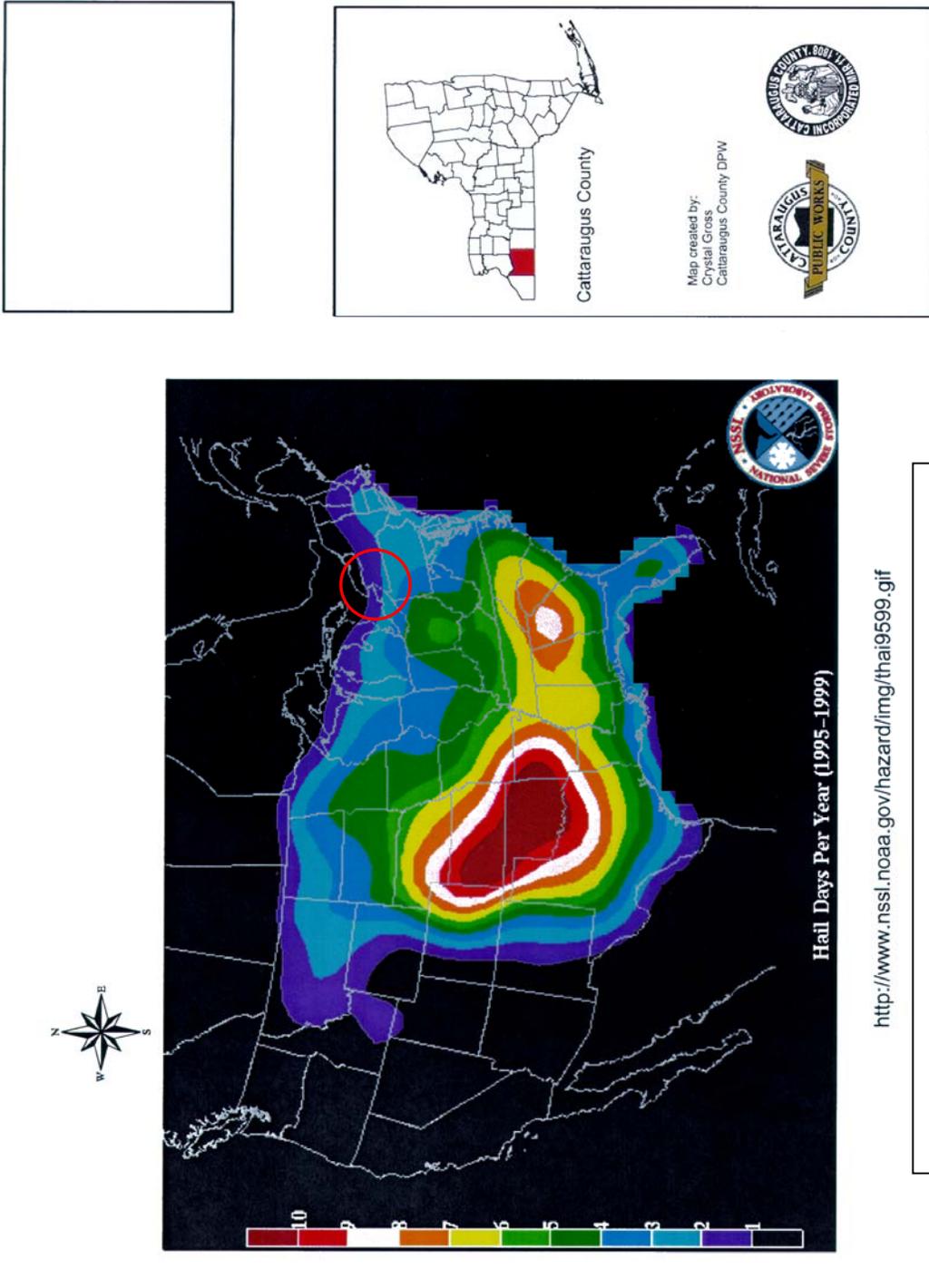
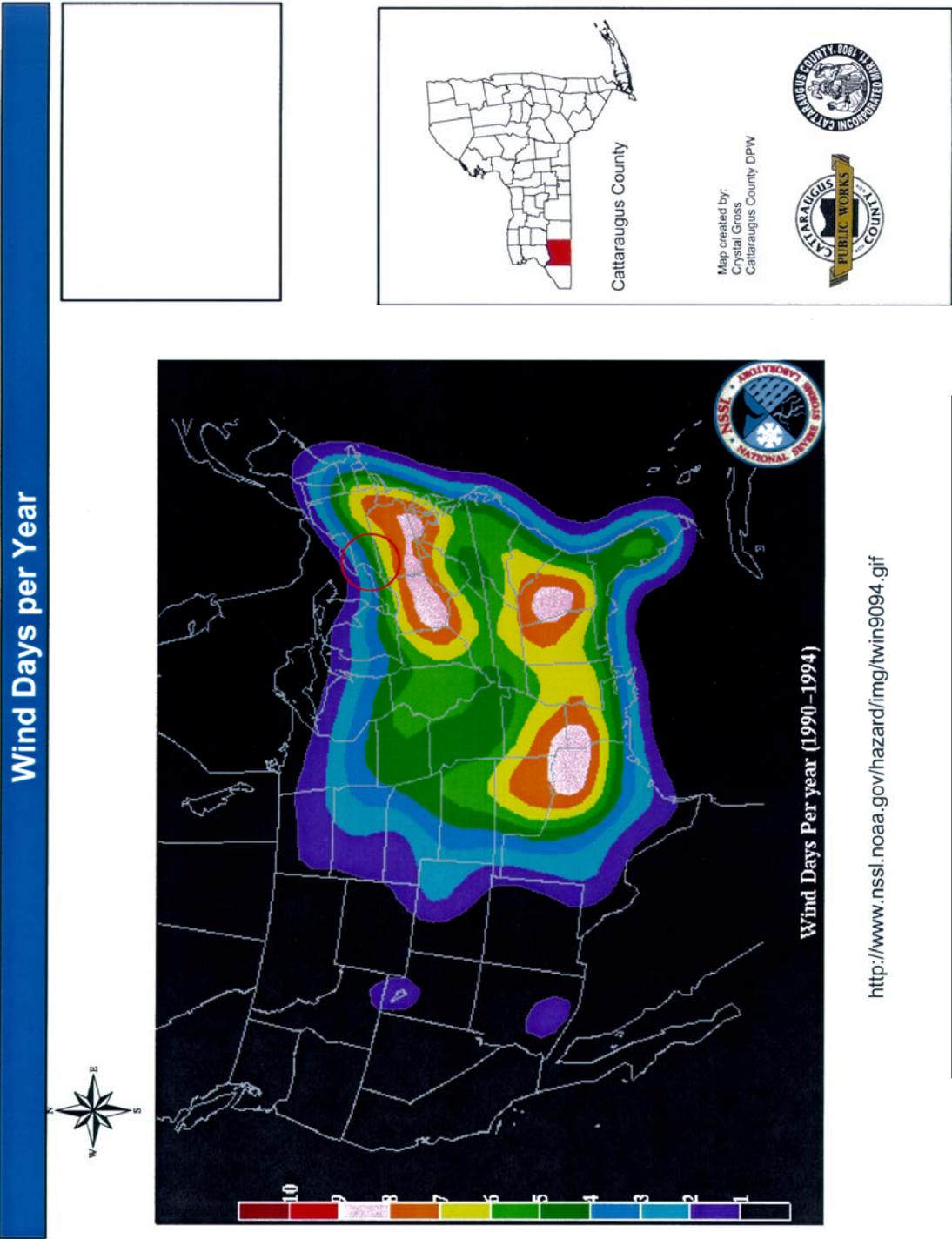
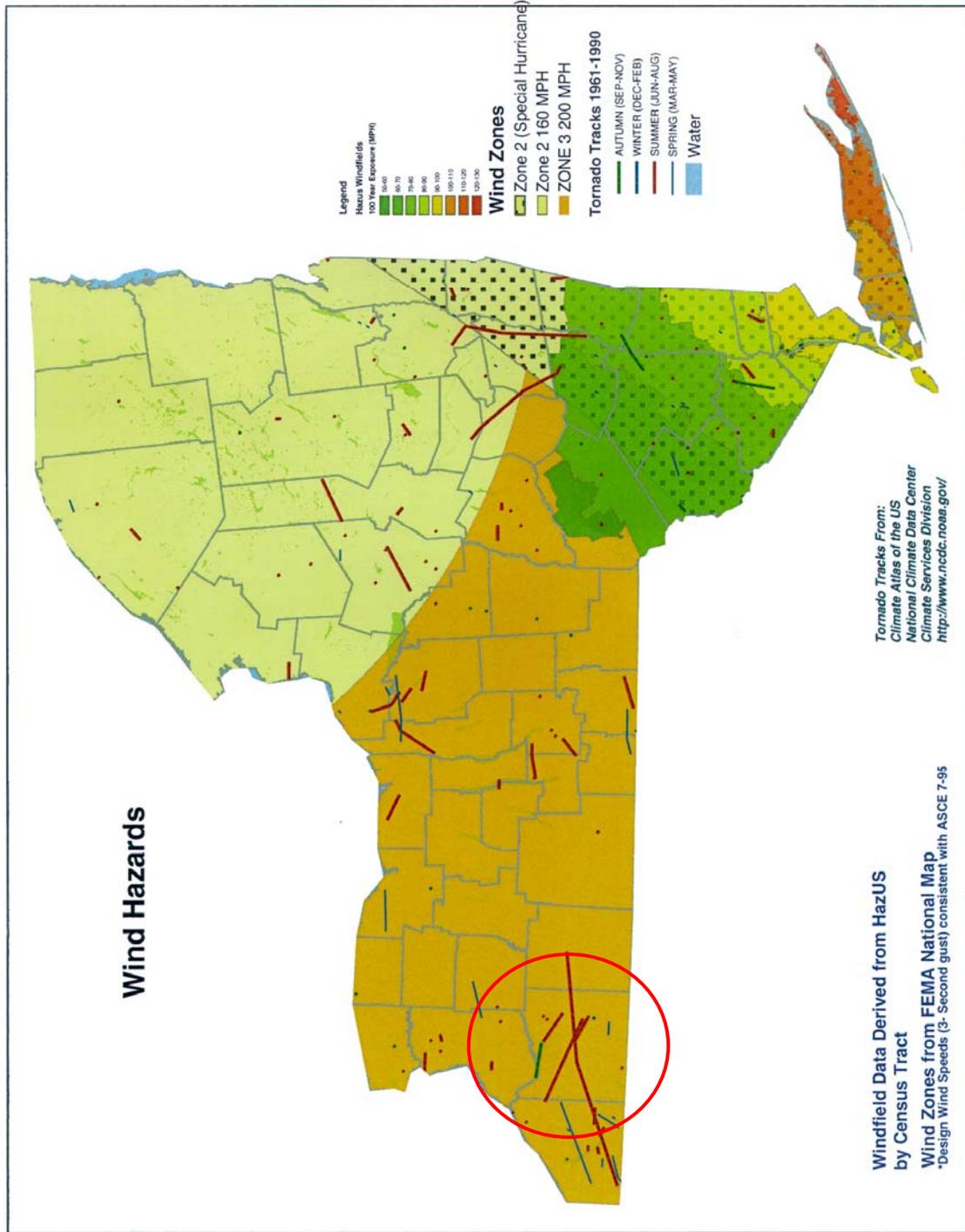


Figure 10



Four to five wind days per year can be expected. A wind day is defined as when winds of higher than 50 kilometers per hour occur.

Figure 11



Cattaraugus County's wind and tornado risk is the same throughout the County. The county is in Wind Zone 3, which indicates that structures should be designed for wind speeds of 200 mph

Figure 12

4.7.3 Floods (Including Flash Floods)

Definition: A great flow of water, a body of moving water, the flowing stream, as of a river, especially a body of water rising, swelling, and overflowing land. **Flash flooding** is rapid flooding of low-lying areas, rivers and creeks that is caused by the intense rainfall associated with a thunderstorm. Flash flooding occurs when the ground under a storm becomes saturated with water so quickly that it cannot be absorbed.

HAZNY Analysis:

- Potential Impact: Large Region
- Cascade Effects: Highly Likely
- Frequency: Infrequent Event
- Onset: Several Days
- Hazard Duration: More Than One Week
- Recovery Time: More Than Two Weeks

Floods are typically described in terms of their statistical frequency. A “100-year floodplain” describes an event or an area subject to a one percent probability of a certain size flood occurring in any given year. This concept does not mean such a flood will occur only once in 100 years. Whether or not it occurs in a given year has no bearing on the fact that there is still a one percent chance of a similar occurrence in the following year. Since floodplains can be mapped, the boundary of the 100-year flood is commonly used in the compilation of floodplain mitigation programs to identify areas where the risk of flooding is significant.

History: There are 29 records for flood events which have occurred in Cattaraugus County in the data reviewed for this hazard mitigation plan (**Appendix C – History of Natural Hazard Events**). Of these 29 records, damage amounts are approximately \$15,884,000. In addition, of these 29 flood events, 26 of them were recorded as flash floods.

In June 1998, Cattaraugus County was declared a State and Federal Disaster Area. During this event, Cattaraugus Creek rose faster than any time in memory and crested two feet over flood stage. Damages in the Village of Gowanda totaled \$1,400,000. In July 2000, the Mayor of Salamanca declared a State of Emergency which included no unnecessary travel in the city due to mudslides and flooding. In August 2003, strong thunderstorms developed dropping 3 to 5 inches of rain in a short amount of time, causing flash flooding. Sections of Route 16 in the Town of Ischua were washed out. Cattaraugus County was declared a State and Federal Disaster Area. (**Table 4 – Federal Declared Storm Events, Page 28**).

The data for flooding and/or flash flooding within Cattaraugus County indicated that two injuries were reported with no fatalities attributed to flooding events.

Probability of Occurrence: Flooding usually results in Cattaraugus County from prolonged heavy rainfall. Other causes of flooding include locally intense thunderstorms, snowmelt and ice jams. Flash floods occur in short periods of time, usually only a few hours. Flooding events are impossible to accurately predict. There may be long extended periods of time with no flooding events caused by rainfall and other times when areas have repeat flooding in the same areas due to consecutive storm events. Major riverine flood occurs approximately once every 15 years, with flash flooding occurring on an every year basis.

Geographic Extent: The information reviewed indicates that flooding affects all jurisdictions within Cattaraugus County. Based on information collected, there were 29 records for flooding in Cattaraugus County two of which occurred in the Allegany State Park.

The flood hazard areas within Cattaraugus County are primarily those areas within the mapped 100-year floodplain (**Figure No. 13 – countywide and Appendix H – by town.**) They are adjacent to the rivers and other watercourses in the county that are subject to flooding. **Figure 13** also shows structures within the floodplain.

Table 6 shows the estimated value of structures that are located within the floodplain. The digital FEMA Q3 data was overlaid on the county's 2002 ortho data. Three thousand, two hundred and ten (3210) rooftops were pinpointed as being within the floodplain. The parcels containing these points were then extracted into a new GIS layer. The resulting layer contained 1975 parcels. To find the estimated value of the structures, the assessed land value amount was subtracted from the total assessed value for the parcel and then multiplied by each individual municipality's equalization rate. The resulting value was used as an estimated structural value.

(TOTAL ASSESSMENT – LAND ASSESSMENT) * EQUALIZATION RATE = EST. STRUCTURE VALUE.

Estimated Value of Structures in Cattaraugus County that is located within the Floodplains

According to **Table 6** the jurisdictions with the highest degree of risk for property loss in the floodplains are: Town of Allegany, Town of Perrysburg, Village of Ellicottville, Town of Ellicottville, Village of Gowanda, Town of Portville, and City of Olean.

Structures Inside Flood Hazard Areas

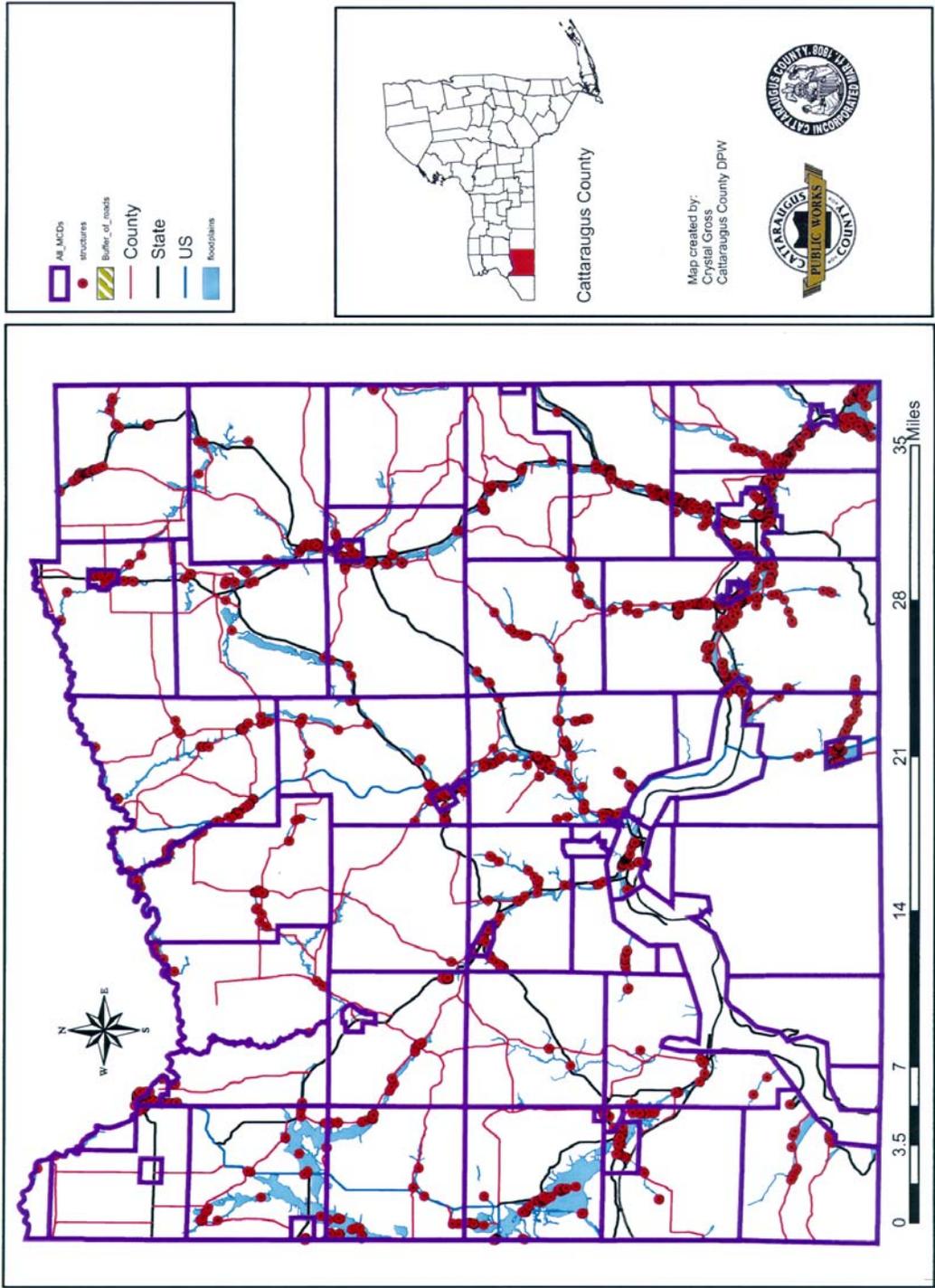


Figure 13

Estimated Value / Number of Structures Located within the Floodplain

MUNICIPAL	Est. Value of Structures	Agriculture	Commercial / Industrial	Community / Gov	Forest	Public Services	Residential	Vacant	Total Number of Structures	Number of Structures in floodplain	% of structures in floodplain
ALLEGANY	48047080	289200	1159500	43869500	11100	24000	2692780	1000	3300	377	11.4
ASHFORD	6248045	161703	4593878				1471187	21277	*	86	
C.OLEAN	10665872		4253614	5642		256437	6150179	0	8465	160	1.9
C.SALAMANCA	5324852		374670	2553460		90435	2305237	1050	4172	68	1.6
CARROLLTON	1255800		53300	263300			914000	25200	988	37	3.7
COLDSRING	1004988	29326		121849	67959		785854	0	1047	39	3.7
CONEWANGO	1272188	327938	5750		0		938500	0	1915	91	4.8
DAYTON	794700	224800		118100			451800	0	1558	30	1.9
EAST OTTO	1977500	223009	181914	251637			1306468	14472	*	53	
ELLCOTTVILLE	17506480		12147236	593373			4765871	0	2249	140	6.2
FARMERSVILLE	1704910	94210	807300				749800	53600	1535	75	4.9
FRANKLINVILLE	1395000	64000	98200	298000			916200	18600	1910	49	2.6
FREEDOM	2446583	56069	393998				1996516	0	2301	78	3.4
GREAT VALLEY	8743815	833177	3091030	544848			4261422	13338	2426	169	7.0
HINSDALE	2498071	279791	541559	338621		319	1337781	0	2192	95	4.3
HUMPHREY	503865	71103					432762	0	796	30	3.8
ISCHUA	1447701		114890	210884		719811	390476	11640	717	29	4.0
LEON	912234	505986		6941			397225	2082	1551	53	3.4
LITTLE VALLEY	6226300	262000	730000	4190000			1044300		895	58	6.5
LYNDON	653300	606000					47300		1155	5	.4
MACHIAS	784526		34421	152842			597263	0	2743	19	.7
MANSFIELD	16900						16900		1332	3	.2
NAPOLI	208118	89412					118706		1395	4	.3
NEW ALBION	858879	36735					769593	52551	1342	47	3.5
OLEAN	5836690		2001600	339300			3323970	171820	2028	154	7.6
OTTO	380200	35600	216400				128200		*	14	
PERRYSBURG	27366327		19388	27012959			333980		1542	23	1.5
PERSIA	967900	72400					889100	6400	607	29	4.8
PORTVILLE	11949100	165100	2964700	346800			8435100	37400	2677	342	12.8
RANDOLPH	386100	62800					323300		1220	19	1.6
SALAMANCA	407700						407700	0	673	18	2.7
SOUTH VALLEY	947150		285300		400000		255250	6600	641	24	3.7
V.ALLEGANY	1900515		675815	212800			1011900	0	1251	116	9.3
V.DELEVAN	6229362		165307	5488901			575154	0	130	24	18.5
V.E.RANDOLPH	749325		35500	370125			343700	0	433	12	2.8
V.ELLCOTTVIL	17549944		8241545				9223579	84820	719	247	34.4
V.FRANKLINVIL	6666500		827500	5472500			366500	0	1306	36	2.8
V.GOWANDA	12673400		2307500	3488800		96100	6770700	10300	1402	225	16.1
V.LIMESTONE	1479400		80900	663200	0	128900	606400	0	339	57	16.8
V.LITTLE VALLE	316000	7300	88500	7000			198300	14900	880	19	2.2
V.RANDOLPH	3427900	66600	1167800	262500		1314100	616900	0	1102	41	3.7
V.S.DAYTON	49500						35500	14000	611	3	.5
YORKSHIRE	492797	99632					390960	2205	178	12	6.7
Total	222273517										

Table 6

* no information available

Table 7 lists the critical facilities located within the floodplain. This data was obtained by overlaying the digital FEMA Q3 data over the county's parcel layer and querying the Real Property data. All parcels were selected having class codes indicating schools, highway garages, welfare, orphanages, health care, hospitals, government, military, police, fire, wells, pipelines, utilities, communication, water, wastewater, and transportation. Individual maps of each municipality were then printed and sent to the local municipality for review and comments. Changes were made as required.

Critical Facilities Located within the Floodplain in Cattaraugus County

MUNICIPALITY	Est. Value of Structures	CABLE TV	CEILING	CELLULAR	COLLEGE	ELECTRIC & GAS	FLOOD CONTROL	GAS GENERATION	GOVERNMENT	HOSPITAL	HWY GARAGE	JUNK WELL	NON-CEILING RAILROAD	OTHER HEALTH	OTHER SCHOOL	POLICE & FIRE	ROAD/STREE/HWY	SCHOOL	SEWAGE	SPECIAL SCHOOL	TELEPHONE	WASTE DISPOSAL	WATER SUPPLY	
ALLEGANY	52043400				1	2		1			1							1		1		1		
ASHFORD	531301862		2																				1	
C.OLEAN	9121222		1			1							1		1			1						2
C.SALAMANCA	17855789												2	2				1	7					2
CARROLLTON	865416		2				1				1													
COLDSPRING	2151669												2			1								
CONEWANGO	535569												3											
DAYTON	199100										1		1											
EAST OTTO	94866														1									
ELLCOTTVILLE	4727024		4								1							1		1				
FARMERSVILLE	299836		1										2											
FRANKLINVILLE	1301802		3			1										1			1					
FREEDOM	0												2											
GREAT VALLEY	1601967		2													1			1					
HINSDALE	1445338		1								2													1
HUMPHREY	91013															1								
ISCHUA	911874		1	1																				
LEON	98671										1							1						
LITTLE VALLEY	4190000										1								1					
MACHIAS	3437053		6								1													
MANSFIELD	0												1											
NEW ALBION	4490												1					1						1
OLEAN	1746677		1										2											
OTTO	131400															1								
PERRYSBURG	25328367									1					1			1						
PERSIA	7000																							1
PORTVILLE	1288455		2			3															1			
RANDOLPH	563853					1							2											
SALAMANCA	423200												1											
V.ALLEGANY	344683				1								1			2								
	3152857												1					1						
V.DELEVAN	5564895		1								1					1		1						
V.E.RANDOLPH-	58000															1								
V.ELLCOTTVILLE	1159755		1													1								
	5684813		1														1	1						
V.GOWANDA	2564700												1					1			1			
V.LIMESTONE	509580	1	1													2			1					1
V.LITTLE VALLEY	2562500										1					1			1					
V.PORTVILLE	242490		1			1																		
V.RANDOLPH	2258104					1							1			1			1					
V.S.DAYTON	31900												1											
YORKSHIRE	678475		1																					
Total	686579665																							

Table 7

Nearly all areas in the county could experience a flash flooding event. This depends on the intensity and duration of rainfall, the steepness of the watershed, the amount of impervious surfaces within the watershed and vegetation. The towns of East Otto, Hinsdale, Humphrey, and Lyndon all made note of the severe threat that flash flooding presents to them.

The Town of South Valley noted that in the past flash flooding has repeatedly combined with beaver dams, causing logs to jam in several of their sluice pipes and creating major washouts of their secondary roads.

Table 8 depicts a breakdown of Estimated Value of Structures in the 100-Year Floodplain verses insurance coverage as a percentage.

The flood events were divided into minor events (\$100,000 and less) and major events (greater than \$100,000) in damages. Over the last 10 years, there has been 14 minor events with total damages of \$490,000 or approximately \$35,000 average per event. The reoccurrence rate would be about 1½ events per year. Eight major events have taken place for a total damage amount of \$18,400,000 averaging \$2.3 million per event. The reoccurrence rate for these major events would be about 0.8 events per year.

Anticipated Magnitude: The depth of the flooding would vary by geographic region throughout the county.

Anticipated Damages:

There is a strong possibility that critical facilities could be affected, causing power outages and loss of other critical services. Additional hazards that can be triggered by a flooding event include transportation accidents, food and fuel shortages. Normal emergency operations can be impeded. Water supplies can become contaminated and become unsafe to drink.

Of the 29 flood events reviewed for this hazard mitigation plan, 26 reflect damages as a result of flash floods and the remaining three categorized as floods. The three flood events had damage totaling \$2,750,000. The data also indicated that two injuries and no fatalities had occurred during traditional or flash flooding events within the county. However, on average, Cattaraugus County experiences three major flooding events per year with an average damage estimate of \$651,517.

NFIP Insurance Report with Estimated Values of Structures entirely within Floodplains by Percentage of Coverage

CID	Community Name	Total Premium	Zone		Curren t Total	Coverage Total	Estimated Value of Structures in floodplain	% insured
			V-	A-				
360061	ALLEGANY, TOWN OF	28590	0	40	57	4972600	48047080	10.35%
360967	ALLEGANY, VILLAGE OF	22548	0	39	43	2884200	1900515	151.76%
360063	CARROLLTON, TOWN OF	2575	0	5	9	460400	1255800	36.66%
361367	CATTARAUGUS, VILLAGE OF	948	0	1	3	112300	0	
360064	COLD SPRING, TOWN OF	1991	0	1	6	771800	1004988	76.80%
360065	CONEWANGO, TOWN OF	981	0	1	4	202600	1272188	15.93%
360066	DAYTON, TOWN OF	0	0	0	0	0	794700	0.00%
361368	DELEVAN, VILLAGE OF	763	0	1	2	106200	6229362	1.70%
360067	EAST OTTO, TOWN OF	2290	0	5	6	273500	1977500	13.83%
360068	EAST RANDOLPH, VILLAGE OF	849	0	1	2	119200	749325	15.91%
360069	ELLICOTTVILLE, TOWN OF	10877	0	23	24	2506400	17506480	14.32%
360070	ELLICOTTVILLE, VILLAGE OF	42031	0	32	43	6638800	17549944	37.83%
360071	FARMERSVILLE, TOWN OF	2629	0	4	8	339600	1704910	19.92%
360072	FRANKLINVILLE, TOWN OF	2784	0	4	6	393300	1395000	28.19%
360073	FRANKLINVILLE, VILLAGE OF	855	0	0	2	298000	6666500	4.47%
360074	FREEDOM, TOWN OF	3564	0	5	8	652800	2446583	26.68%
360075	GOWANDA, VILLAGE OF	29258	0	42	66	3744400	12673400	29.55%
360076	GREAT VALLEY, TOWN OF	9282	0	15	29	1989300	8743815	22.75%
360077	HINSDALE, TOWN OF	3212	0	4	9	528900	2498071	21.17%
360078	HUMPHREY, TOWN OF	372	0	0	1	60000	503865	11.91%
360079	ISCHUA, TOWN OF	1575	0	3	4	208200	1447701	14.38%
	LEON, TOWN OF						912234	0.00%
360081	LIMESTONE, VILLAGE OF	358	0	0	2	100000	1479400	6.76%
361066	LITTLE VALLEY, TOWN OF	1729	0	2	6	264900	6226300	4.25%
360082	LITTLE VALLEY, VILLAGE OF	519	0	0	3	104900	316000	33.20%
360083	LYNDON, TOWN OF	0	0	0	0	0	653300	0.00%
360084	MACHIAS, TOWN OF	395	0	0	1	80000	784526	10.20%
360085	MANSFIELD, TOWN OF	0	0	0	0	0	16900	0.00%
360086	NAPOLI, TOWN OF	0	0	0	0	0	208118	0.00%
360087	NEW ALBION, TOWN OF	1243	0	2	4	240800	858879	28.04%
360088	OLEAN, CITY OF	102096	0	56	163	23065800	10665872	216.26%
360089	OLEAN, TOWN OF	18852	0	24	40	3387400	5836690	58.04%
360090	OTTO, TOWN OF	781	0	1	2	202500	380200	53.26%
360091	PERRYSBURG, TOWN OF	0	0	0	0	0	27366327	0.00%
360092	PERSIA, TOWN OF	284	0	0	1	40300	967900	4.16%
360093	PORTVILLE, TOWN OF	50143	0	72	109	7480100	11949100	62.60%
360094	PORTVILLE, VILLAGE OF	31053	0	4	67	7302800	0	
360095	RANDOLPH, TOWN OF	6078	0	1	3	1136500	386100	294.35%
360096	RANDOLPH, VILLAGE OF	1882	0	1	4	318200	3427900	9.28%
360097	SALAMANCA, CITY OF	10381	0	4	25	1878700	5324852	35.28%
360098	SALAMANCA, TOWN OF	589	0	1	2	59700	407700	14.64%
361591	SENECA NATION OF INDIANS	13267	0	22	35	1471400		
360100	SOUTH VALLEY, TOWN OF	0	0	0	0	0	947150	0.00%
361104	YORKSHIRE, TOWN OF	425	0	0	2	187000	492797	37.95%
360062	ASHFORD, TOWNSHIP OF	1114	0	1	3	212600	6248045	3.40%
Totals		409163	0	417	804	74796100	222224017	

33.66% INSURED

Table 8

4.7.4 Winter Storms

Definition: A winter storm can range from moderate snow over a few hours to blizzard conditions that last several days. All winter storms are accompanied by low temperatures and blowing snow, which can severely reduce visibility. A severe winter storm is one, which drops four or more inches of snow during a 12-hour period, or six or more inches during a 24-hour span. An ice storm occurs when freezing rain falls from clouds and freezes immediately on impact. All winter storms make driving and walking extremely hazardous.

HAZNY Analysis:

- Potential Impact: Large Region
- Cascade Effects: Highly Likely
- Frequency: Regular Event
- Onset: Several Hours Warning
- Hazard Duration: Two to Three Days
- Recovery Time: One to Two Days

History: The information reviewed for this hazard mitigation plan reveals that winter storms have affected all of the jurisdictions within Cattaraugus County. **(Appendix C)**. The data also indicates that single storms have previously been reported as affecting multiple sites within the county, as well as multiple sites throughout the state. These events are listed as snow squalls, heavy snow, heavy snow squalls, winter storm, excessive snow, or blizzard events. Records indicate that the towns in northern Cattaraugus County are hit harder by winter storm events, particularly the Town of Perrysburg which was mentioned 21 times and received 26” of snow in one event and 51” of snow in another event. South Dayton, located in the northwest portion of the county, is also hit hard by winter weather. In one event, it is recorded that 54” of snow fell in the Village of South Dayton. **Figure No. 14** shows the average season snowfall in Cattaraugus County.

Average Season Snowfall

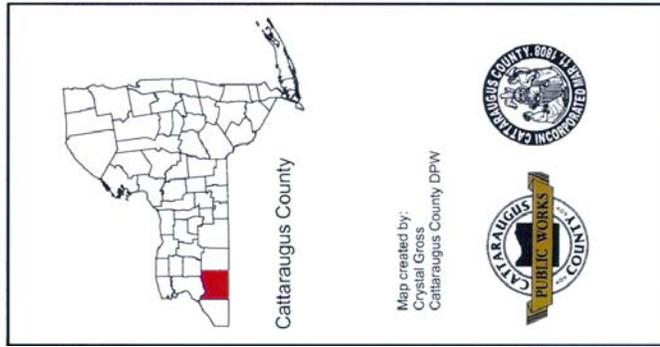
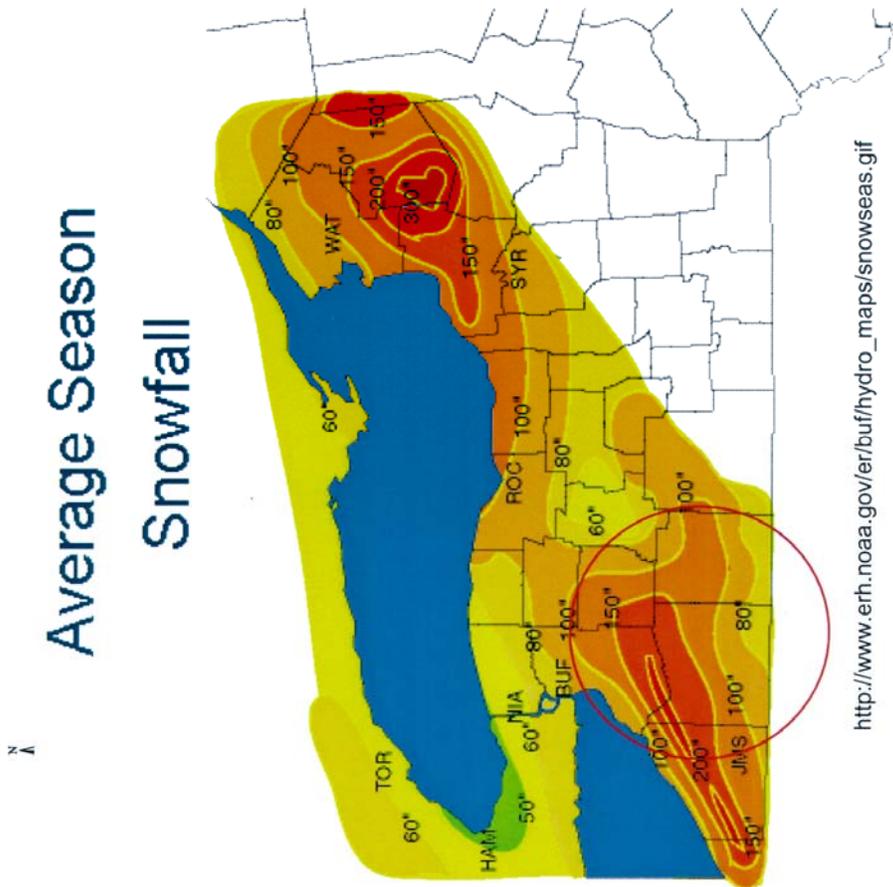


Figure 14

Probability of Occurrence: Most of the severe winter storms in Cattaraugus County result from lake effect snow from Lake Erie. Lake effect snow is caused when very cold air flows over the relatively warmer water of a large lake. Evaporation from the lake surface under these conditions forms convective clouds that can not contain all of this water, and some of it falls back to the surface as snow. Lake effect snow showers often form into bands or lines, with abrupt edges to the falling snow. One location can receive a foot of snow, while another location just a few miles away receives only flurries. Cattaraugus County is prone to winter storms that have affected every jurisdiction within Cattaraugus County. On average, winter storms occur approximately seven times a year. See **Table 4, Page 28** for winter related declared disasters.

Geographic Extent:

Portions of northern Cattaraugus County are located within the traditional snowbelt. These areas would be affected more often by lake effect snow from Lake Erie. Cold air crossing the warmer waters of Lake Erie results in lake effect snow. In general, these northern portions of the county are more often hit with more events and deeper snows. However, other portions can also be impacted by occasional severe events.

Anticipated Magnitude:

- **Blizzard warning** - Sustained winds or frequent gusts of 35 mph (56 km/h) or greater, considerable falling and/or blowing snow reducing visibility frequently to 1/4 mile (0.4 km) or less for a period of three hours or more. There are no temperature criteria in the definition of a blizzard but freezing temperatures and 35 mph winds will create sub-zero wind chills.
- **Heavy snow warning** - Snowfall of 6 inches (15 cm) or more in 12 hours or less, or 8 inches (20 cm) or more in 24 hours or less.
- **Lake effect snow warning** - Lake effect snowfall of 6 inches (15 cm) or more in 12 hours or less, or 8 inches (20 cm) or more in 24 hours or less.
- **Ice Storm warning** - Accumulations of 1/4 inch (6 mm) or more of freezing rain.
- **Heavy sleet warning** - Accumulations of 1/2 inch (12 mm) or more of sleet.

Anticipated Damages:

There is a reasonable possibility that critical facilities could be affected, causing power outages and loss of other critical services. Additional hazards that can be triggered by a winter storm event include transportation accidents, food and fuel shortages, exposure to cold temperatures and utility disruption. Normal emergency operations can be impeded. Since winter storms take place during the frigid winter months, many people, especially the elderly and infirm, may be stranded without heat and basic necessities.

The principal cost resulting from winter storms is the expense of snow removal by highway departments. Indirect losses result from the disruption of normal transportation and economic disruption. Some structural damage can occur if heavy snow knocks down trees or buildings.

Information reviewed for this hazard mitigation plan indicates that there have been four instances in which a Federal Disaster was declared for Cattaraugus County because of winter storms. This information also indicates that there have been no fatalities or injuries due to winter storm events. The following Federal declared disasters total:

March 1993 Blizzard	\$141,668.00
January 1999 Snow Emergency	\$297,418.30
November 2000 Snowstorm	\$317,570.91
December 2001 Snowstorm	\$472,117.46

Cattaraugus County has 82 records for winter storms in the data reviewed for this hazard mitigation plan (**Appendix C**). Of these 82 records, total damage amounts are approximately \$10,768,787 over the last 50 years. An average winter storm would produce \$150,000 in damages (snow removal costs) with the maximum anticipated impact being \$1,000,000 from this worse case type of event.

4.7.5 Wildfire / Fire / Drought

Definition: Wildfire - A fire that is burning strongly and out of control on an area of grass or bushes in the countryside. Also known as a **forest fire** is a fire often caused by lightning; other common causes are human carelessness and arson. Drought and the prevention of small forest fires are major contributors to extreme forest fires. Wildfires often begin unnoticed. They spread quickly, igniting brush, trees and homes. **Fire** is a rapid, self-sustaining oxidation process of combustible gases ejected from a fuel. It starts by subjecting the fuel to heat or another energy source, e.g. a match or lighter, and is sustained by the further release of heat energy.

Drought is defined as an extended period of deficient rainfall relative to the statistical mean for a region. In Cattaraugus County droughts normally occur after several winters of less than average snowfall, lowering the level of the water table and causing some springs and wells to dry up. It becomes a concern when several low snowfall winters are followed by an extremely hot and dry summer. This makes the forested portions of Cattaraugus County vulnerable to forest and brushfires.

HAZNY Analysis (Wildfire):

- Potential Impact: Small Region
- Cascade Effects: Highly Likely
- Frequency: Regular Event
- Onset: No Warning
- Hazard Duration: Two to Three Days
- Recovery Time: Less than One Day

History: Although Cattaraugus County has the potential for a major wildfire, a California type of forest fire is small (normal/below normal). Cattaraugus County does have its share of forest/brush fires, losing approximately 200 acres per year. Because of the vast amount of hardwood (Deciduous) trees, and their natural characteristic of losing/shedding their leaves in the fall, the county's forests have plenty of natural fuel for fires. However, because of the annual rainfall in our area, most fires are not caused by natural causes. Most forest/brush fires in Cattaraugus County are caused by downed power lines servicing the oil/gas industry, unattended burn barrels, campfires, or arson.

The Town of Coldspring noted that brush fires are often set along old Rte.17 during the summers. The Town of Little Valley noted that small areas of the nearby state forest areas catch fire every five years, causing heavy smoke. The Village of Cattaraugus noted the vulnerability of its main business district should the surrounding forest catch fire.

Figure No. 15 depicts the observed fire danger for Cattaraugus and **Figure No. 16** is the Drought Severity Index (Weekly Value for Period Ending 15 May 2004) by the Climate Prediction Center, NOAA.

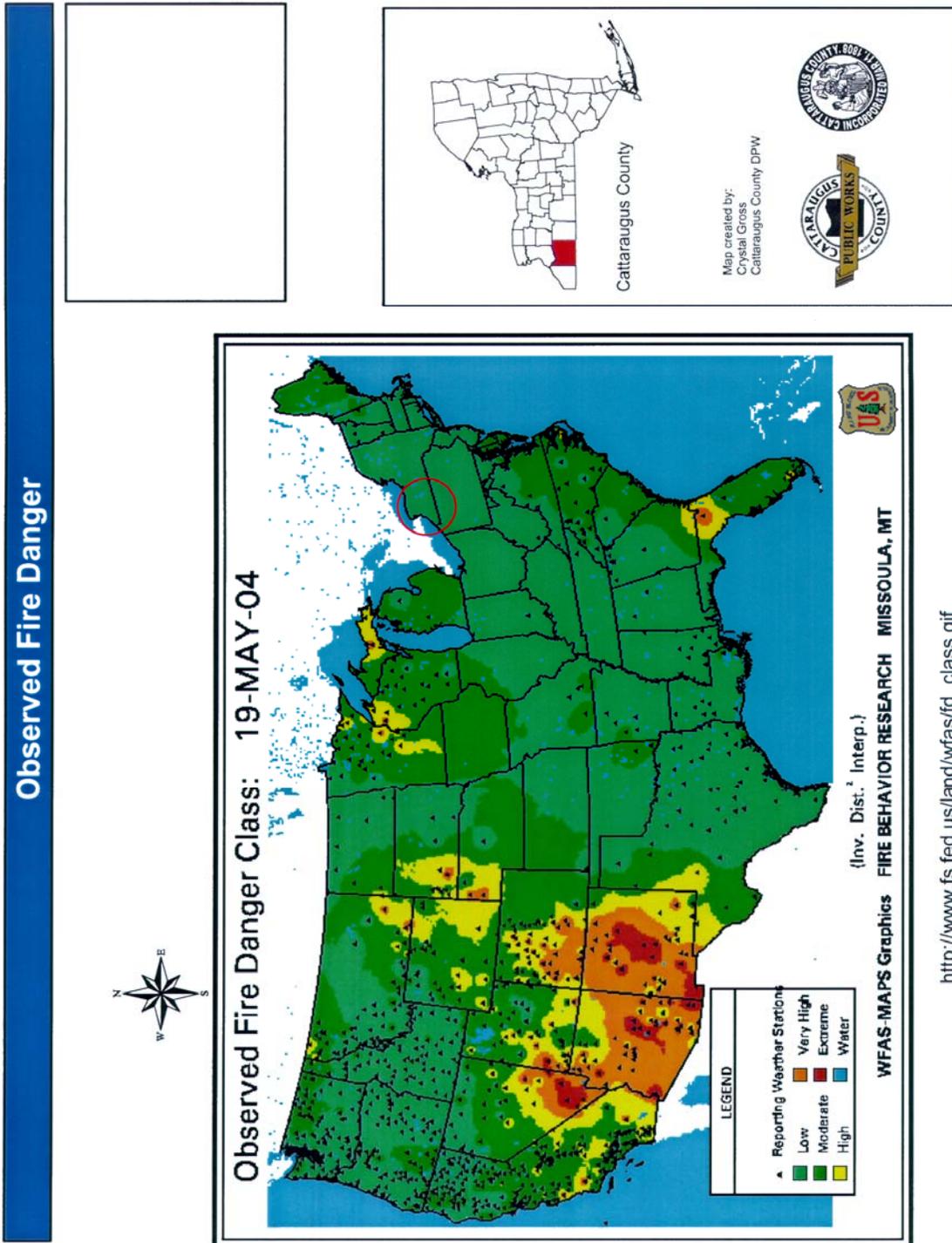


Figure 15

Drought Severity Index

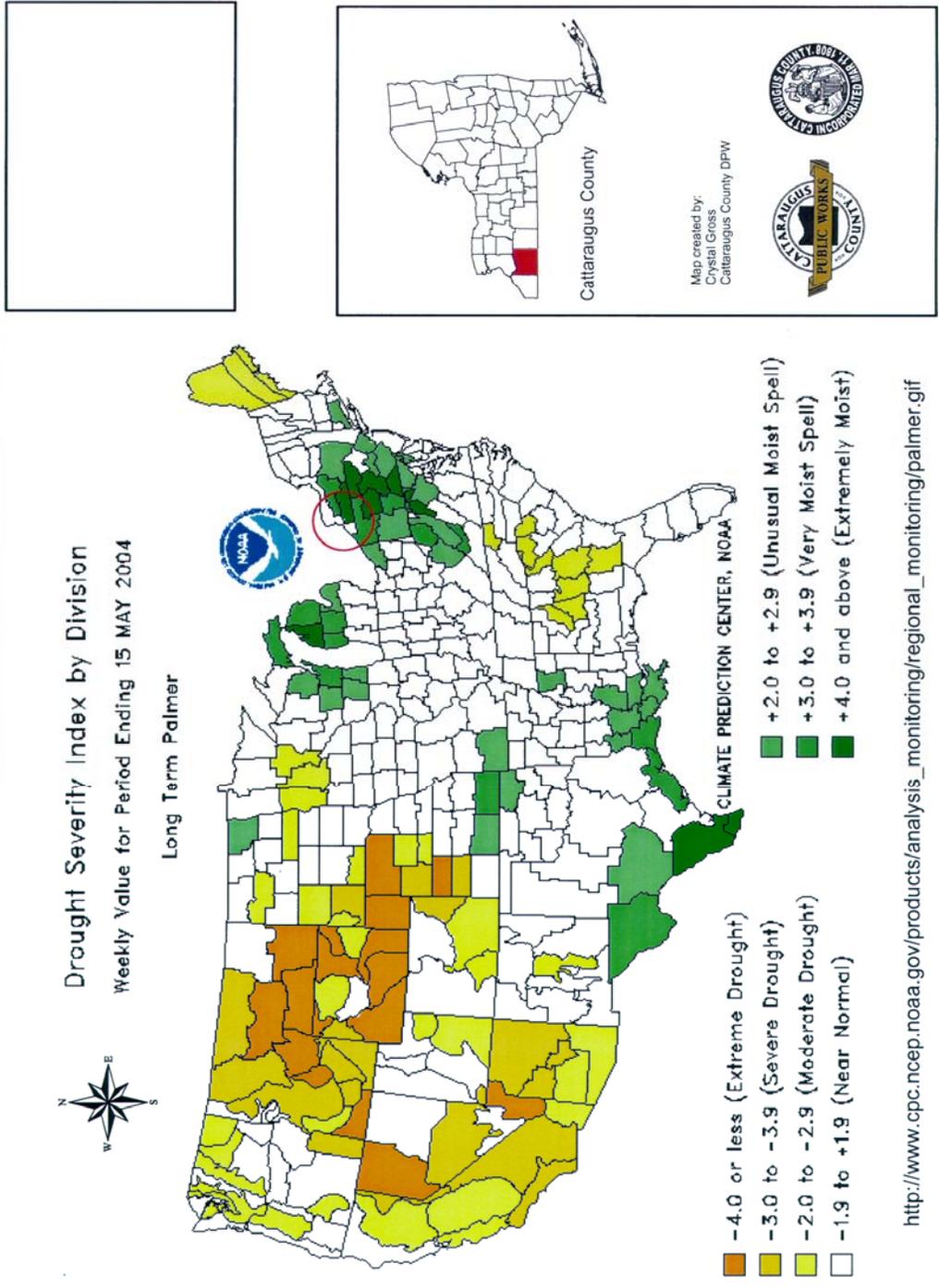


Figure 16

Probability of Occurrence: The potential for a severe wildfire/drought to occur in Cattaraugus County is Normal to Below Normal – with small occurrences every five years.

Rock City State Forest is a 6,015 acres reforestation area located in the Town of Little Valley. Two thousand, nine hundred and five acres of this Rock City State Forest are owned by the State.

McCarty Hill State Forest is a 3,110 acres state-owned reforestation area located in the Town of Little Valley. This park spans across towns of Great Valley, Little Valley, Mansfield and Ellicottville.

Windfall Creek State Forest is a 968 acres state-owned reforestation area located in the Town of Great Valley. This park spans across the towns of Great Valley and Carrollton.

Allegheny Reservoir Access is a 1,100 acres state owned park located in the Town of South Valley along the west shore of the Allegheny Reservoir.

Allegheny State Park is located in Cattaraugus County and contains 65,000 acres. Most of this park is primitive woodland. There are two developed areas, Red House and Quaker. There are over 300 campsites and 300 cabins. Allegheny State Park features a mix of hemlock/hardwood forest, mountains, rolling hills, meadows, streams, ponds and lakes.

Anticipated Magnitude:

A credible worst case wildfire in Cattaraugus County would be one that results in the complete loss of several rural structures and up to 1,000 acres of timber damage.

Anticipated Damage:

Records reviewed for this plan indicate that there have been no major wildfires/fires and/or droughts in Cattaraugus County. Depending on the location, the damage caused by a 1,000 acre fire could amount as high as \$300,000 in damages.

4.7.6 Tornado

Definition: A tornado is defined as a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of 1 mile wide and 50 miles long. In an average year, 800 tornadoes are reported nationwide.

Tornadoes are classified according to the damage they cause. Through observational studies, T. Theodore Fujita created the following scale in the late 1960's to classify tornadoes. The scale correlates wind speeds with the following damage:

Fujita Tornado Scale

Scale	MPH	Expected Damage
F-0	40-72	Light Damage - Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F-1	73-112	Moderate Damage - Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off road.
F-2	113-157	Considerable Damage - Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F-3	158-206	Severe Damage - Roofs and some walls torn off well-constructed houses, trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown.
F-4	207-260	Devastating Damage - Well-constructed houses leveled; structure with weak foundations blown off some distance; cars thrown and large missiles generated.
F-5	261-318	Incredible Damage - Strong frame houses lifted off foundations and swept away; automobile sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

Table 9

HAZNY Analysis:

- Potential Impact: Large Region
- Cascade Effects: Highly Likely
- Frequency: Infrequent Event
- Onset: No Warning
- Hazard Duration: Less Than One Day
- Recovery Time: Three Days to One Week

History: According to data reviewed (**Appendix C and Table No. 10, below**), it has been reported that tornadoes have affected Cattaraugus County at least ten times since 1957. The data also indicates that tornadoes within Cattaraugus County have resulted in four injuries and zero deaths.

There were three F-0, five F-1, and two F-3 magnitude tornadoes reported as shown on the below table:

MAGNITUDE OF REPORTED TORNADES

LOCATION	DATE OF EVENT	TORNADO LENGTH/ WIDTH	MAGNITUDE	FATALITIES	INJURIES
Unknown	5/15/61	3 miles/ 33 yards	F3	0	0
Unknown	8/17/65	300 yards	F0	0	0
Town of Humphrey	7/24/67	11 miles/ 250 yards	F3	0	0
Unknown	2/24/75	1 mile/100 yards	F1	0	2
Unknown	6/5/75	1 mile/17 yards	F0	0	0
Unknown	9/18/77	12 miles/100 yards	F1	0	0
Unknown	6/29/80	10 miles/40 yards	F1	0	0
Unknown	8/28/90	1 mile/ 60 yards	F0	0	2
Unknown	7/17/92	1 mile/20 yards	F1	0	0
Freedom	6/13/94	1 mile/17 yards	F1	0	0

Table 10

Probability of Occurrence: Records indicate that tornadoes have occurred approximately 2-3 times per decade. Tornadoes occurring within Cattaraugus County are classified as a moderately low hazard with most of the recorded tornado events occurring in the spring/summer seasons.

Geographic Extent: The information used to complete this report shows that nine tornadoes occurred in Cattaraugus County, but does not specify in which town/village/city. One recorded tornado hit in the Town of Freedom on 6/13/94 and was recorded as an F1. **Figure No. 18** shows the tornado days per century.

Anticipated Magnitude: F2

Anticipated Damages:

There is a very high possibility that critical facilities could be affected, causing power outages, communication disruption and loss of other critical services. Additional hazards that can be triggered by a tornado event include transportation accidents, and depletion of available emergency responders. Normal emergency operations will be impeded. Loss of life could be anticipated.

The tornado that occurred on February 24, 1975 produced two injuries. There are no fatalities reported due to tornado events. Total property damage for the above mentioned tornadoes is approximately \$3.6 million. The average damage would be approximately \$360,000, per event with a worst case tornado causing as much as \$2,500,000 to \$3,000,000, in damages. Potential loss of life and injuries could be anticipated.

Significant Tornado Days Per Century

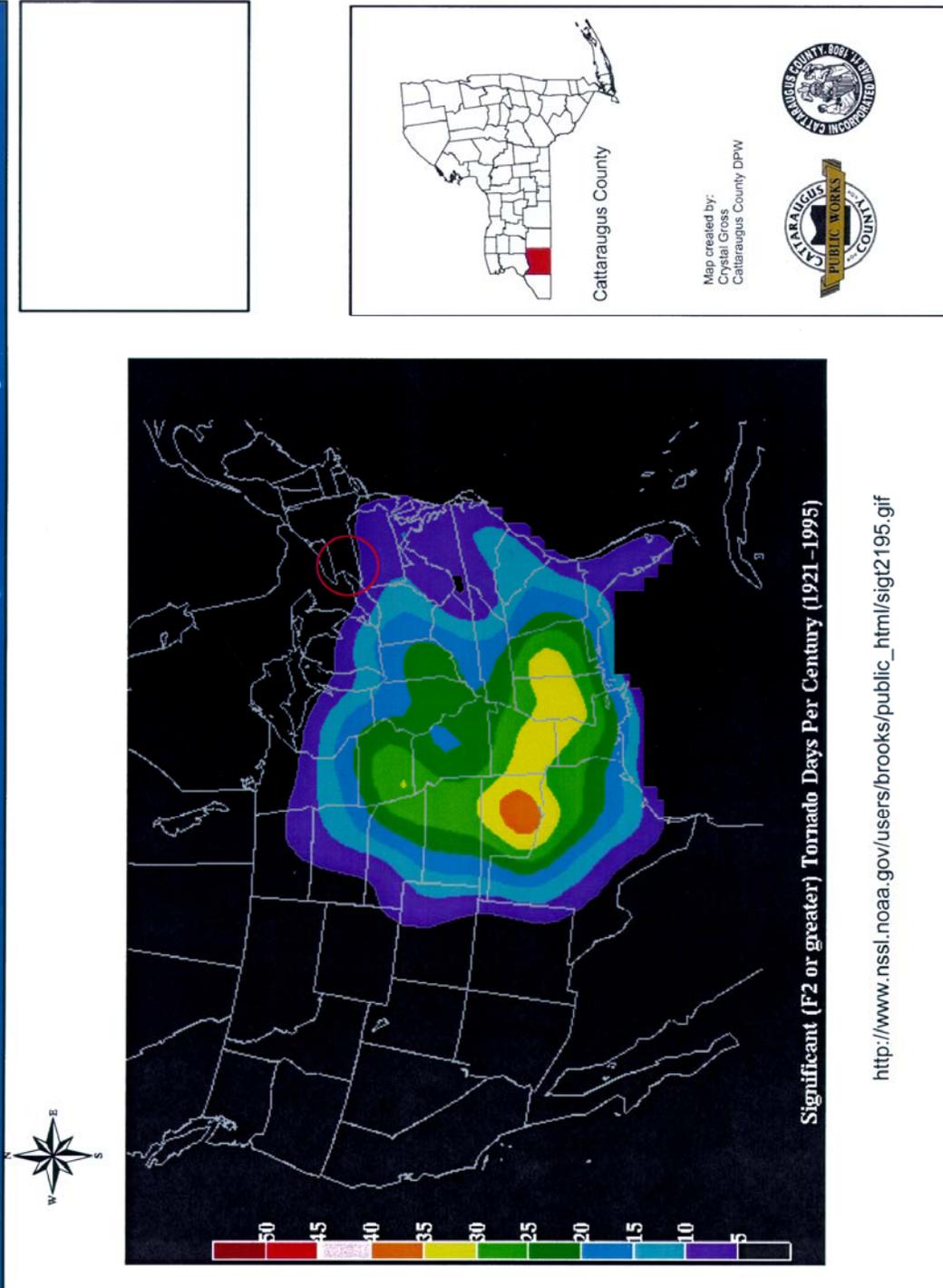


Figure 18

4.7.7 Ice Jam

Definition: If heavy rain and unusually mild temperatures move into a location with a deep snow cover and frozen rivers, ice jam flooding can result. The melting snow, combined with the heavy rain, causes frozen rivers to swell. The rising water breaks the ice layer into large chunks, which float downstream and often pile up near narrow passages or near obstructions, such as bridges and dams. The ice dam often forces water to overflow the river banks and flood nearby homes and businesses. Many of the floods in the Northeast and Ohio Valley, during the rain and warm up following the "Blizzard of 1996", were caused by ice jams.

HAZNY Analysis:

- Potential Impact: Several Individual Locations
- Cascade Effects: Highly Likely
- Frequency: Regular Event
- Onset: One Day Warning
- Hazard Duration: Four Days to One Week
- Recovery Time: One to Two Days

History: Cattaraugus County has not experienced major ice jam problems in recent years, but localized ice jams occasionally develop on tributary streams in Cattaraugus County. The Town of Little Valley reported that once every three years a tributary of Little Valley Creek causes an ice jam at the culvert on Whig Street, flooding the nearby hayfield. The Village of Gowanda, with a long history of flooding, is especially vulnerable. Ice jams have also historically occurred on the Allegheny River from the City of Olean to the City of Salamanca.

Probability of Occurrence: Ice jams are most likely to occur during the early spring months as ice blocks begin to melt due to the increasing temperature. In Cattaraugus County Ice Jams are infrequent events, occurring once every eight to fifty years.

Geographic Extent: Generally, ice jams are a countywide hazard and can occur anywhere in areas along streams where debris and ice jams have developed at bridges. Similar flooding and erosion problems may be found near culverts. However, historically, most ice jams occur at specific riverine areas.

Anticipated Magnitude: Flooding caused by an ice jam will last until the ice breaks up, either naturally or as a result of human intervention. The resulting flood damages would be localized and not likely to impact more than a few nearby houses. The maximum expected losses would be \$24,000 (based on average flood damages of \$8,000).

4.7.8 Dam Failure

Definition: Dam failures can occur as a result of structural failures, such as progressive erosion of an embankment or by overtopping and breaching by a severe flood. Earthquakes may also weaken a dam's integrity and have the ability to cause a dam failure. Two factors influence the potential severity of a full or partial dam failure; the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

HAZNY Analysis:

- Potential Impact: Small Region
- Cascade Effects: Highly Likely
- Frequency: Rare Event
- Onset: No Warning
- Hazard Duration: One Day
- Recovery Time: One Week to Two Weeks

History: Information reviewed for this hazard mitigation plan indicates that there has been no dam failure recorded for Cattaraugus County. The failure of large beaver dams has occurred in surrounding areas within Cattaraugus County. These structures are in generally removed areas and significant damages have not generally occurred. Glover's Mill near the Village of East Randolph had a minor dam that failed in 2000 damaging a number of downstream residences. **Figure 3, Page 13** illustrates the locations of dams within Cattaraugus County.

NAME OF DAM	DAM LOCATION	DAM SIZE
Conewango Creek – Site 1	SR 394, Town of Randolph, Davis Brook	61,261 cubic yards Earthen Fill – 43’ height
Conewango Creek – Site 3	County Road 64, Town of Ellington, Chautauqua County, Tributary of Clear Creek	
Conewango Creek – Site 6	County Road 85, Town of Cherry Creek, Chautauqua County, Cherry Creek	
Conewango Creek – Site 9A	Smith Road, Town of Villenovia, Chautauqua County, Tributary of West Branch	
Conewango Creek – Site 13 (New Albion Lake)	County Road 5, Town of New Albion, Conewango Creek	116,078 cubic yards, Earthen Fill – 39’ height
Conewango Creek – Site 16	County Road 7, Town of Napoli, Elm Creek	87,677 cubic yards, Earthen Fill, 49’ height
Conewango Creek – Site 16A	Walker Road, Town of Conewango, Elm Creek	234,279 cubic yards, Earthen Fill, 42’ height
Conewango Creek – Site 19	County Road 8, Town of Randolph, Battle Creek	95,264 cubic yards, Earthen Fill, 65’ height
Conewango Creek – Site 33	Pickup Hill Road, Town of Cherry Creek, Chautauqua County, Little Cherry Creek	
Ischua Creek – Site 1	County Road 16, Town of Machias, Upper Ischua Creek	66,950 cubic yards, Earthen Fill, 28’ height
Ischua Creek – Site 2	County Road 80, Town of Farmersville, Johnson Creek	138,749 cubic yards, Earthen Fill, 38’ height
Ischua Creek – Site 3	State Route 98, Town of Farmersville, Carpenter Brook	100,066 cubic yards, Earthen Fill, 38’ height
Ischua Creek – Harwood Lake	State Route 98, Town of Farmersville, Carpenter Brook	NYSDEC –Owner
Ischua Creek – Site 4	County Road 46, Town of Franklinville, Saunders Creek	102,600 cubic yards, Earthen Fill, 51’ height
Ischua Creek – Site 5	Livingston Road, Town of Lyndon, Tributary of Gates Creek	214,000 cubic yards, Earthen Fill, 52’ height
Ischua Creek – Site 6A (Case Lake)	County Road 24, Tributary of Franklinville, Gates Creek	298,821 cubic yards, Earthen Fill, 62’ height
Holimont Upper Reservoir Dam		
Red House Lake Dam		
William O Nannen Pond Dam		
Sunset Saddle Dam (Holimont)		
Rotary Lake Dam	Camp Scout Haven	
Richard Weishan Pond Dam		
Edgar Ploetz Recreational Pond Dam		
Rainbow Lake Dam		
Camp Chautauqua Pond Dam		
Quaker Run Dam		
Lime Lake Outlet Dam		
James Hughey Dam		
Kapic Pond Dam		
Efner Davis Pond Dam		

Table 11

Probability of Occurrence: Although a dam failure could occur in Cattaraugus County, it is an infrequent event and would potentially impact a small region (as per the Glover’s Mill event). According to the International Commission of Large Dams (ICOLD), the three major causes of dam failure are overtopping by flood, foundation defects, and piping. The probability of failure is estimated in excess of 1 in 50 years.

Geographic Extent: There are a total of nine dams within the Conewango Creek Watershed. Four of them are in Chautauqua County and all flow to Cattaraugus County. Five are located in Cattaraugus County, with one of these being a combined recreational area (New Albion Lake). The Conewango Watershed is periodically inspected by the Conewango Creek Watershed Association, NRCS and the Cattaraugus County Soil & Water Conservation.

The Ischua Creek Watershed has seven dams, two recreational (Harwood Lake and Case Lake), one county and one NYSDEC. This watershed also has one retention basin and one levee system both located in the Town of Franklinville. NRCS, Cattaraugus County Soil & Water Conservation and the Cattaraugus County Department of Public Works periodically inspect this watershed.

Cabic Pond is located on Route 353 approximately three miles north of the Village of Cattaraugus in a rural area and is not considered to be a major threat if it should fail.

Town of East Otto – Plato Rd – Timber Lake (privately owned)

The Town of Salamanca noted the ‘Newton Street Mountain’, a mountain south of the city watershed. Dam failure here could potentially slide into Newton Creek causing flooding of creek or mudslides.

Anticipated Magnitude: Complete failure.

Anticipated Damages:

If the Harwood Lake Dam, located above the Village of Franklinville should fail, there is a very high possibility that critical facilities would be affected, causing power outages and loss of other critical services. Additional hazards that can be triggered by a dam failure event include transportation accidents, damage to residential and commercial areas and damage to highway infrastructure. Normal emergency operations can be impeded. Loss of life could be anticipated.

The failure of the Harwood Lake Dam could result in loss of life and millions of dollars in damage.

The following structures are currently classified as **“C” high hazards** by the New York State Department of Environmental Conservation:

- Ischua Creek Site 1 Dam
- Ischua Creek Site 4 Dam
- Davis Brook Dam (Conewango Site #1)
- Ischua Creek Site 6A Dam
- Ischua Creek Site 5 Dam
- Ischua Creek Site 2 Dam
- Conewango Creek Site 16 Dam
- Conewango Creek Site 16A Dam
- Conewango Creek Site 19 Dam
- Holimont Upper Reservoir Dam

These structures are currently classified as high hazards. Failure of these dams could cause loss of life, serious damage to homes, public utilities, highways and may cause extensive economic loss.

The following structures are currently classified as **“B” Moderate Hazards** by the New York State Department of Environmental Conservation:

- Red House Lake Dam
- Conewango Creek Site 13 Dam
- William O Nannen Pond Dam
- Sunset Saddle Dam (Holimont)
- Rotary Lake Dam (Camp Scout Haven)
- Richard Weishan Pond Dam
- Edgar Ploetz Recreational Pond Dam
- Harwood Lake Dam
- Kingsbury Hill Dam (Ischua Watershed #3)
- Rainbow Lake Dam
- Camp Chautauqua Pond Dam
- Quaker Run Dam
- Lime Lake Outlet Dam
- James Hughey Dam
- Kapic Pond Dam
- Efner Davis Pond Dam

Cattaraugus County is in the preliminary stages of developing an Emergency Action Plan for dam failures within Cattaraugus County.

4.7.9 Earthquake

Definition: Trembling or shaking movement of the Earth's surface. Most earthquakes are minor tremors. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. The subterranean point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter. The magnitude and intensity of an earthquake are determined by the use of scales, e.g., the Richter scale and the Mercalli scale.

HAZNY Analysis:

- Potential Impact: Large Region
- Cascade Effects: Some Potential
- Frequency: Rare Event
- Onset: No Warning
- Hazard Duration: Less Than One Day
- Recovery Time: One to Two Days

History: There are no historic records of earthquakes occurring specifically in Cattaraugus County; however, records do indicate that there have been tremors in Western New York beginning in 1857. The US Coast and Geodetic Survey in 1951 classified portions of Western New York as an area of moderate seismic risk. The most recent earthquake was felt on May 25, 1995. In addition, an earthquake originating in the St. Lawrence River Valley sent tremors ranging from the Atlantic Coast to the Mississippi River and from Canada to South Carolina. This quake was felt within a 2 million square mile area (including Western New York) and registered VIII on the Modified Mercalli Scale. **Figures 19 & 20** depict the seismic hazards within Cattaraugus County.

New York Seismic Hazard

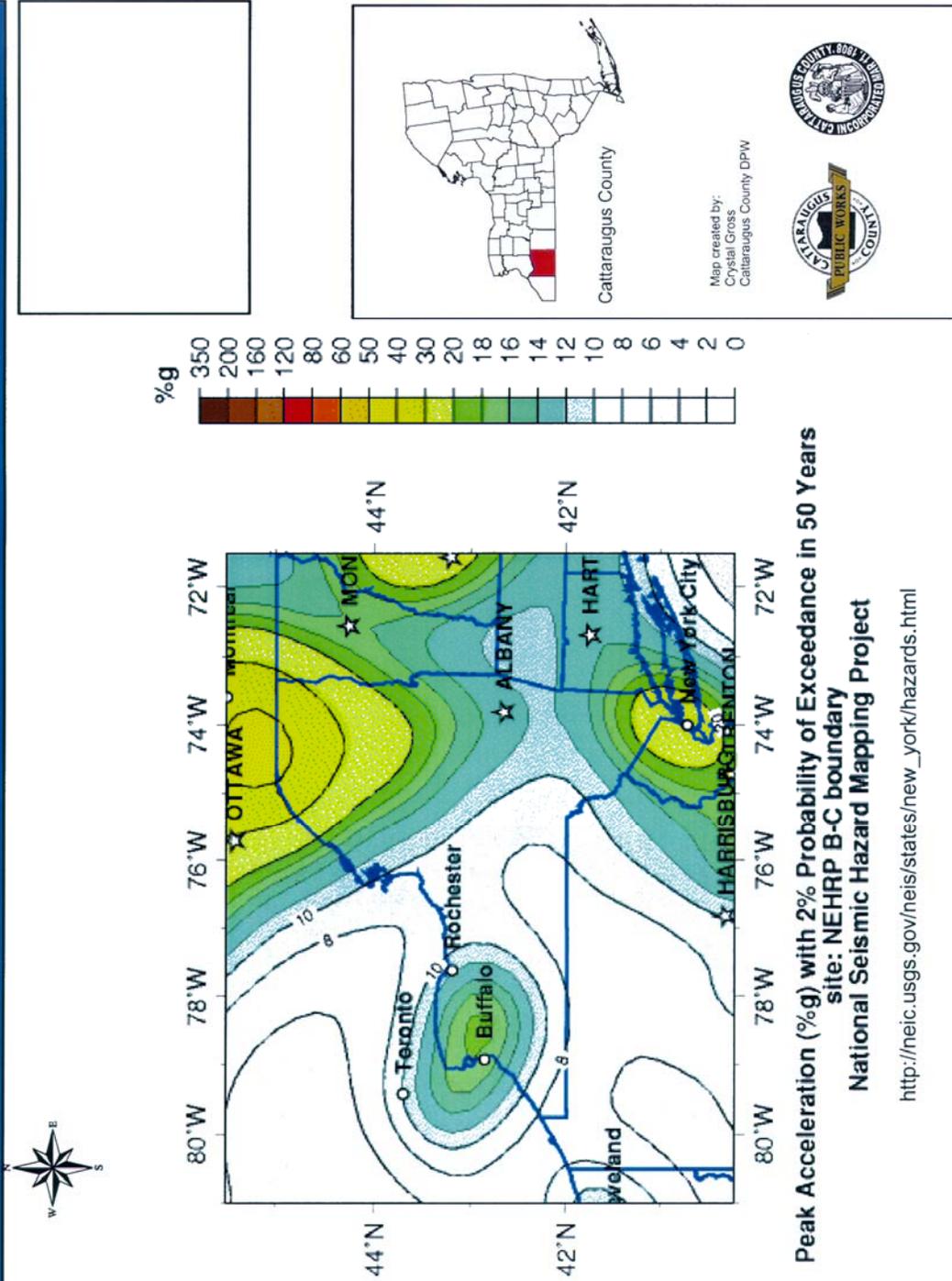
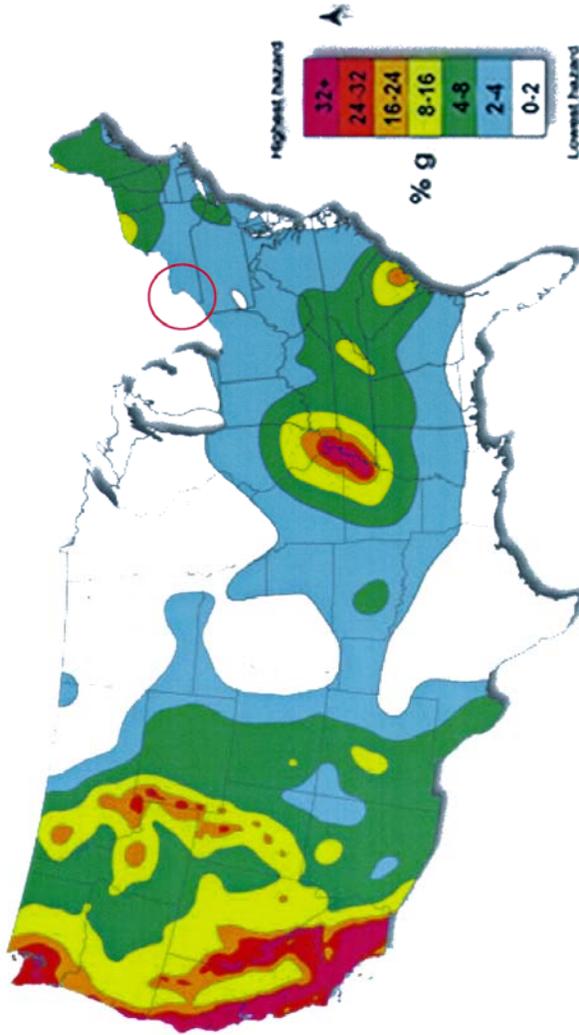


Figure 19

Seismic Hazard



http://eqhazmaps.usgs.gov/images/2002US_scale.jpg

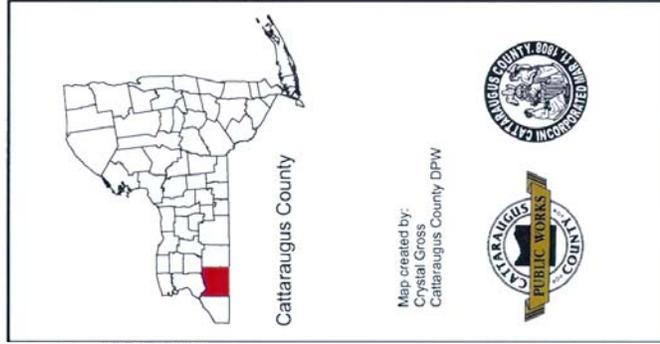


Figure 20

Probability of Occurrence: The probability of an earthquake occurrence in Cattaraugus County is a moderately low hazard.

Geographic Extent: There are no major fault zones within Cattaraugus County; however, numerous seismic events have occurred in and adjacent to Western New York. Minor faults do exist in the northern portion of the county.

Anticipated Magnitude: Peak acceleration with 2 percent probability of exceedance in 50 years.

Anticipated Damages:

Although our findings do not list Cattaraugus County specifically, our research indicates that Western New York will undoubtedly continue to add future seismic events to the record lists. The potential for moderately destructive quakes exists. The historic record suggests that we can expect to experience some local minor tremors again in the future.

If an earthquake should occur there is a possibility that critical facilities could be affected, causing power outages and loss of other critical services. Additional hazards that can be triggered by an earthquake event include transportation accidents and utility disruption. Normal emergency operations could be impeded.

Several jurisdictions have listed earthquakes as being a risk to their communities on their surveys. Most buildings in the county are two stories high or less, therefore damages would be low and are estimated to be \$100,000.

4.7.10 Landslide

Definition: The downward and outward movement of slope-forming materials reacting to the force of gravity. Slide material may be composed of natural rock, soil, artificial fill, or combinations of these materials. The term landslide is generalized and includes rock falls, rockslides, creep, block glides, debris slides, earth flow, mud flow, slump, and other similar terms.

History: They occur after heavy rains when steep banks wash down into the roadways. The Route 16 corridor, between Franklinville and Hinsdale, has had large landslides. The Town of New Albion has several trouble spots where severe erosion and land subsidence occurs. The Town of Yorkshire noted land subsidence occurring on Creek and Bolton Roads with several “sink holes”. Of note are the Town of East Otto – Connoisarauley Road and Town of Persia – Point Peter and Dewey Roads. **Figure 21** depicts known slide areas. According to information taken from the Landslide Inventory Map of New York pub. 1989, produced by NYSGS, Cattaraugus County has had 17 incidences.

The Village of Cattaraugus noted that three roads in or near the Village have dropped. The main business district of the Village is situated on a steep slope. Threats of a landslide from the nearby hill are always a concern, with Leavenworth and Waverly streets being especially vulnerable. There are about a dozen homes that are at risk in the Village of Cattaraugus due to land subsidence.

The City of Salamanca noted riverbank scour and settlement along the banks of the Allegany River.

Historical Areas of Landslide & Land Subsidence

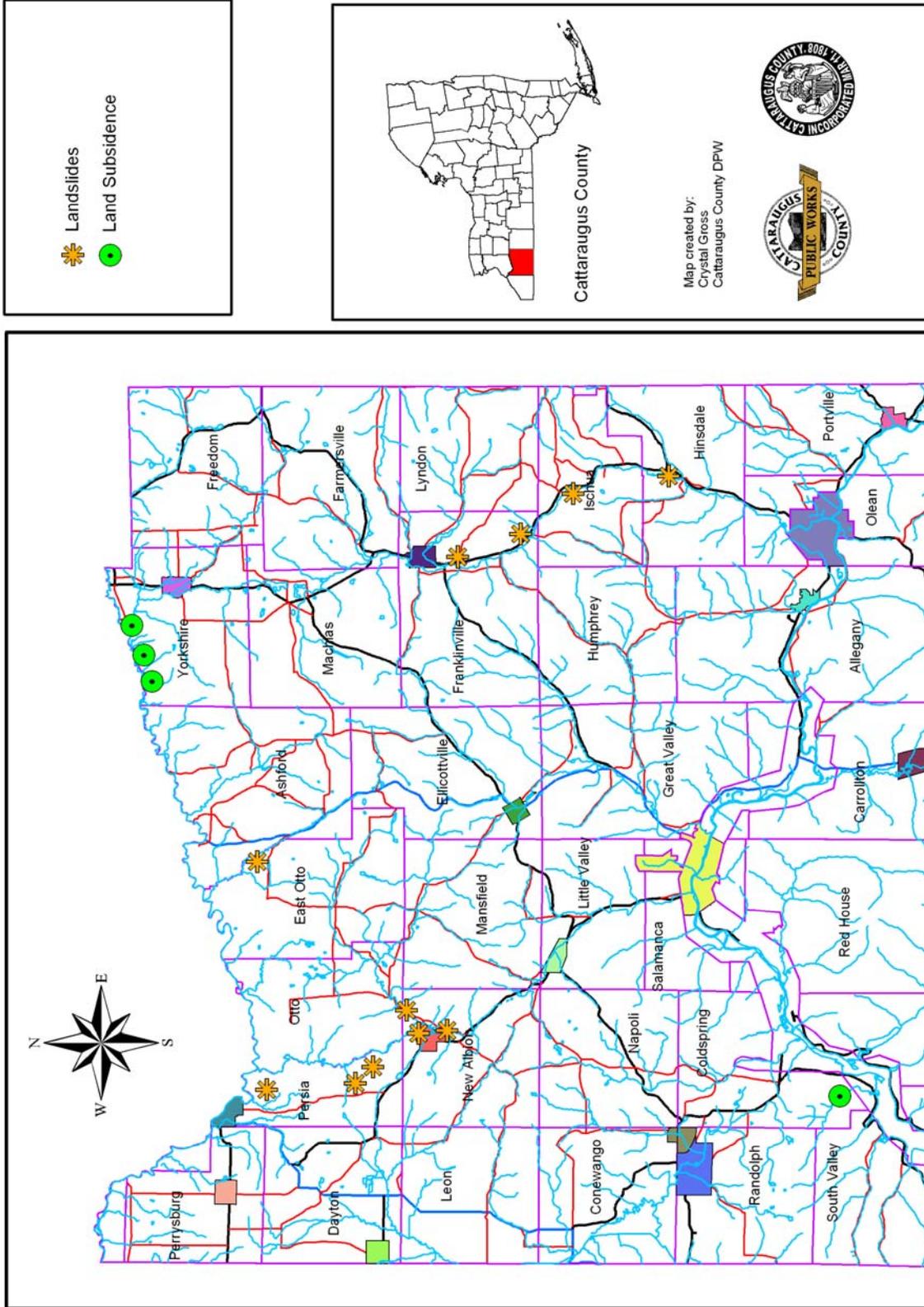


Figure 21

Probability of Occurrence:

Landslides occur after a period of intense heavy rain and are estimated to occur along with flooding, estimated three per year. In addition, some areas have continuous slides that are accelerated by precipitation events.

Geographic Extent:

Landslides have occurred throughout Cattaraugus County, but are mostly located along Cattaraugus Creek, which makes up the northern border of the County. To date, landslides have impacted very small areas. In one instance, along County Road 76 (Lovers Lane Road) in the Town of New Albion, the earth around one residence dropped approximately 4 feet in the Spring of 2004. The road adjacent to this property needs continual maintenance to ensure the safety of the travelling public. Other sites would include County Road 12 in the Town of Otto, Connasauley in the Town of East Otto, Town Line Road in the towns of Ashford/Yorkshire and Creek Road in the Town of Yorkshire. The Village of Cattaraugus has to repair water and sewer utilities on a regular basis, for example, four times in the Spring of 2004.

Anticipated Magnitude:

The amount of damage associated with landslides is small, but they are constantly reoccurring in regular maintenance and repair costs of impacted roads (\$30,000.per year). In addition, if residential damage occurs and deemed not able to rehabilitate, private losses could approach \$50,000 to \$80,000 per residential structure.

4.7.11 Land Subsidence

Definition: Land subsidence is the lowering of the land-surface elevation from changes that take place underground. The principal causes are aquifer-system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost (National Research Council, 1991). Three distinct processes account for most of the water-related subsidence--compaction of aquifer systems, drainage and subsequent oxidation of organic soils, and dissolution and collapse of susceptible rocks. Land subsidence causes many problems including: (1) changes in elevation and slope of streams, canals, and drains; (2) damage to bridges, roads, railroads, storm drains, sanitary sewers, canals, and levees; (3) damage to private and public buildings; and (4) failure of well casings from forces generated by compaction of fine-grained materials in aquifer systems

History:

The Town of Yorkshire noted land subsidence occurring on Creek and Bolton Roads with several "sink holes". The Town of Coldspring noted that Youngs Rd is experiencing land subsidence. **Figure 21** depicts known subsidence areas.

Probability of Occurrence:

In Cattaraugus County there is low probability of occurrence.

Geographic Extent:

Creek Road in the Town of Yorkshire and Youngs Rd in Town of Coldspring are known areas, though land subsidence could occur in other areas as well.

Anticipated Magnitude:

A drop of the surface elevation of up to four feet could occur.

Anticipated Damages:

Road reconstruction and property damage resulting from land subsidence could be as high as \$100,000 per incident.

4.8 Community Profile

In order to determine what assets in Cattaraugus County are at risk for losses due to a natural hazard event, an inventory of assets were compiled listing the estimated value of structures (**Table 6, Page 42**) that are located within the floodplains, which include:

- Agriculture
- Commercial/Industrial
- Community/Government
- Forest
- Public Services
- Residential
- Vacant

The county also inventoried all critical facilities (**Table 8, Page 45**) located in Cattaraugus County along with critical facilities that are located within the floodplain (**Table 7, Page 43**).

For other natural hazard events that are not easily mapped, historical data was reviewed in **Appendix C**. It should be noted that dollar values are calculated at the time of the occurrence and not prorated to current value at the time of plan development.

4.8.1 Critical Facilities

Critical facilities are defined in the FEMA planning guide as those facilities that "Are essential to the health and welfare of the whole population and are especially important following hazard events". Critical facilities are defined as fire stations, police/law enforcement facilities, hospitals, shelters, administration buildings, airports, nursing home/assisted care facilities. County staff provided information regarding the number and location of these facilities within Cattaraugus County. **Table 12, Page 68** lists type and number of critical facilities per municipality.

A total of **457** critical facilities were identified within Cattaraugus County. These include **50** fire and police stations, **5** hospitals, and **1** airport. **Table 7, Page 43** shows the locations of critical facilities within Cattaraugus County.

Critical Facilities in Cattaraugus County

MUNICIPALITIES	EST. VALUE OF CRITICAL FACILITIES STRUCTURAL VALUE	AIR TRANSPORTATION																																				
		CABLE TV	CEILING RAILROAD	CELLULAR TOWERS	COLLEGE COMMUNICATION	ELECTRIC & GAS ELECTRIC & GAS SPEC FRAN	FLOOD CONTROL	GAS GENERATION PLANT	GAS PIPELINE GOVERNMENT	HEALTH CARE	HOSPITAL	HWY GARAGE	JUNK WELL	MILITARY	MISC SPEC FRAN	MOTOR VEHICLE SERVICE NON-CEILING RAILROAD	OIL WELL	OTHER HEALTH	OTHER SCHOOL	POLICE & FIRE	RADIO	ROAD/STREE/HWY	SCHOOL	SEWAGE	SPECIAL SCHOOL	TELECOMMUNICATIONS	TELEPHONE	TV SPEC FAN	WASTE DISPOSAL	WATER SPEC FRAN	WATER SUPPLY	WATER TRANSPORTATION	WELFARE					
ALLEGANY	55487829		1	1		2	1				2	10			1	3			1	1	1	1					1	1										
ASHFORD	539302929	1	2	1							2								3			1				2		1		1								
C.OLEAN	113381146		1	4		1		1	2	2	1	1	1	1	6	3	3					12	1	1	3				7	1								
C.SALAMANCA	34199079		1					2	1	1	1		1	2	2						1	3	10	1	1			4	1									
CARROLLTON	870016		2			1					1									1																		
COLDSRING	2382599										1				2				2							1												
CONEWANGO	1329319					1					2				3	1		1				2	1	1														
DAYTON	601300										2				2	1		1	4																			
EAST OTTO	484471										1						1	1																				
ELLCOTTVILLE	4963537	1	5	1							2	1										1	1							1								
FARMERSVILLE	330836		1												3			2																				
	1374708		3			1												1				1	1		1	1				1								
FREEDOM	1519049										1				2							1								4								
GREAT VALLEY	16887929		3								1	1			2			2				1	1	1					2									
HINSDALE	11096071		1								3				2	1	1	1								1				1								
HUMPHREY	261661										1							1																				
ISCHUA	3497814	1	1	1														2				1																
LEON	267209				1						1							1				4			1													
LITTLE VALLEY	4225400										1								1																			
LYNDON	54000																		1																			
MACHIAS	3907053		6								2	1		1				2	1							2				1								
MANSFIELD	484400										1				1			1								1												
NAPOLI	1117130										1						2	1				1			1					1								
NEW ALBION	173503										1				2		1					2								7								
OLEAN	8866842	1	1			1	1				1				2	4	2		1	2		1				2												
OTTO	157100																																					
PERRYSBURG	27666836										1				4	1		1				1		4						3								
PERSIA	602294							1			1														1					1								
PORTVILLE	16744215		2					3														1		1														
RANDOLPH	563853							1							2																							
RED HOUSE	69700										1																											
SALAMANCA	620700	1									1				1												1											
V.ALLEGANY	5743817				1										1						2		1	1														
	11726734										1				1							2		2				1										
V.DELEVAN	5564895		1								1											1		1														
	357000																					1				2												
	1261563		1																			1																
	9016313		1																			1		3														
V.GOWANDA	5332900										3										2		1	3			1									1		
V.LIMESTONE	5047380	1	1								1	2			1		1				2		1	1		1				1					1	1		
V.LITTLE	4934900										2							1	1	1			1	1		1										1		
	2210205							1			2				2						1			1	2											1		
V.PORTVILLE	607690		1					2		2	1										1						1										1	
V.RANDOLPH	12052436							2			2				1	2		2				1	2			1										1		1
V.S.DAYTON	451300										1							1				1					1										2	1
YORKSHIRE	30143000		2								1				1											1											5	
Total	947940661																																					

Table 12

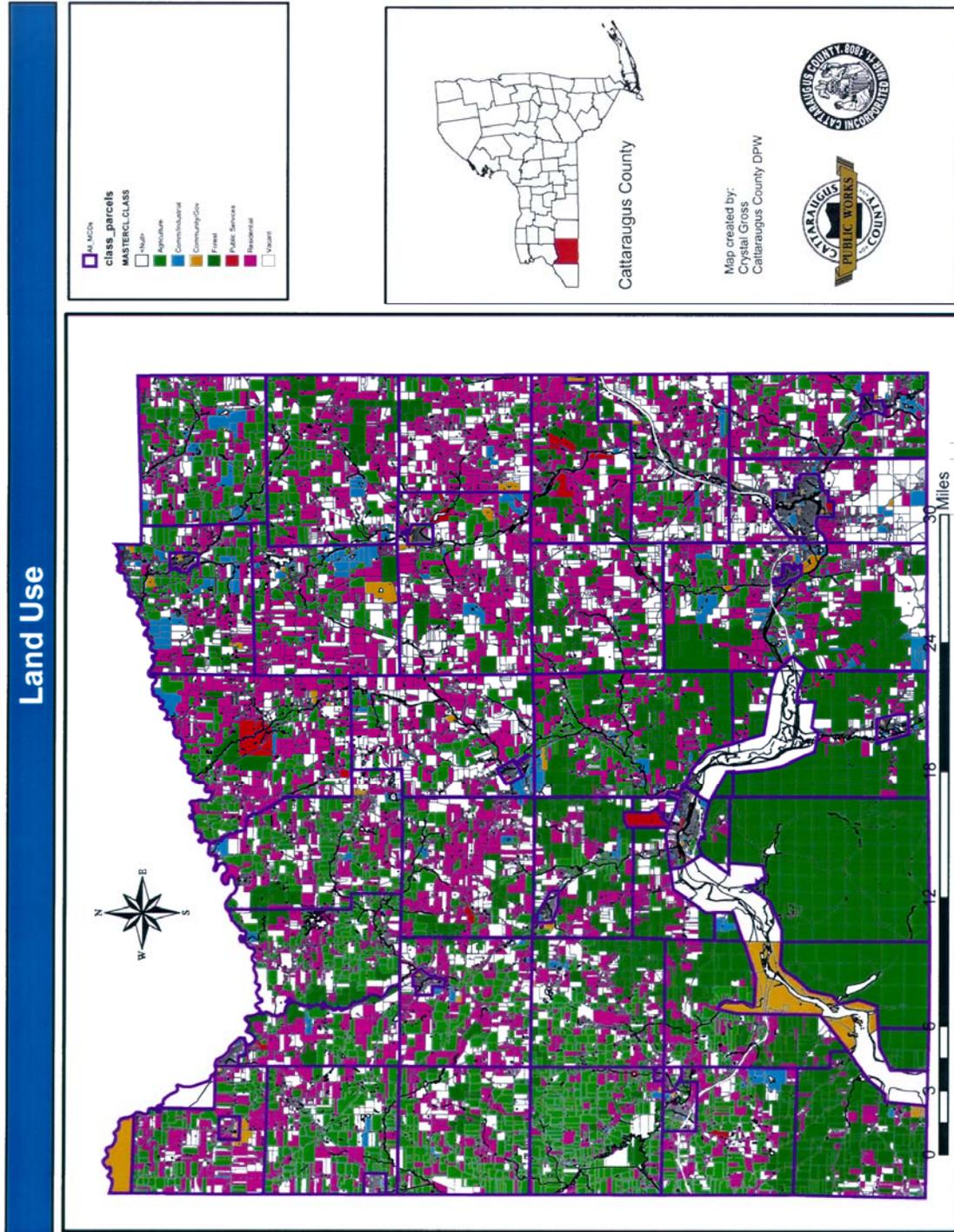


Figure 22

In addition, a GIS database has been developed by county forces that maps the county and local infrastructure, critical facilities (**Table 8, Page 45**), and land uses (**Figure 22**).

4.8.2 Population Data

Cattaraugus County's entire population is at risk for natural hazard events to occur. While certain events, such as an earthquake, dam failure or wildfire would be considered a rare occurrence, there is no way to predict when such an event would take place within Cattaraugus County or how many people might be impacted.

According to the United States Census Bureau, there are 39,839 housing units in Cattaraugus County (2000 census). Most of the population lies in the cities of Olean and Salamanca and the Town of Allegany.

There are 3,210 residences in the floodplain. At 2.52 persons per household, there are 8,090 people living in the 100-year floodplain within Cattaraugus County.

For other hazard events, typically tornadoes, severe storms and flash floods are generally confined to a small area. If these events occur in one of the higher populated areas, there could be substantial property damage. Events such as winter storms are more widespread and the amount of damage or injuries depends on the intensity of the event.

4.8.3 Future Growth

New York State Route 219 is currently being studied for an upgrade to a four-lane highway from its current termination in Springville (Erie County) to the City of Salamanca in the near future. A committee of local representatives made up of county, village and town officials and property owners has been established as the Route 219 Development Committee. This Committee is undertaking corridor economic development and land use planning along Routes 219, 16, 62 and near the Allegany State Park. Appropriate development along these corridors and at interchanges along I-86 is promoted. The Committee is working closely with the NYSDOT to achieve these goals.

The total county population is stagnant or slightly decreasing. There are shifting population trends within the county showing primarily decreases in the cities and villages and increases in the surrounding towns. **Table 2, Page 7** depicts these shifts.

4.9 Vulnerability Analysis and Loss Estimation Summary

Table No. 13 represents the estimated losses for each of the identified natural hazards based upon the analysis procedures that are described in this document. This information was based upon data, which was available at the time this plan was prepared.

VULNERABILITY ANALYSIS AND LOSS ESTIMATION SUMMARY

Natural Hazard	Anticipated Frequency	Anticipated Injuries	Anticipated Loss of Life	Anticipated Damage
Ice Storms	1 every 3 years	0	0	\$30,000 (0.0010%)*
Severe Storms	7 per year	2	0	\$22,000 (0.0007%)*
Flood	3 per year	0	0	\$652,000 (0.0216%)*
Winter Storms	7 per year	0	0	\$150,000 (0.0050%)*
Wildfire/Fire	1 every 5 years	0	0	\$300,000 (0.0994%)*
Tornado	1 every 3 years	2	Yes	\$3,000,000 (0.0994%)*
Ice Jam	1 every 8-50 years	0	0	\$24,000 (0.0008%)*
Dam Failure	<1 every 50 years	Yes	Yes	>\$10,000,000 (0.3313%)*
Earthquake	1 every 8-50 years	Yes	0	\$100,000 (0.0033%)*
Landslide	3 per year	0	0	\$30,000 (0.0010%)*

Table 13

* Represents percentage of total structure value in the county (\$3,018,253,231) – 2003
The Anticipated Damage comes from the Natural Hazard Profiles.

5.0 Mitigation Plan

5.1 Hazard Mitigation Goals

Hazard mitigation is a process whereby hazards are identified, risks and vulnerabilities are quantified, awareness is created and cooperative efforts are undertaken to prevent, reduce or eliminate losses.

Upon review, it became readily evident that there is a need to continue with the project committee. An integral part of Cattaraugus County's Multi-Hazard Multi-Jurisdictional Plan will be the ongoing review and recommendations of the project committee or their designee.

5.2 Cattaraugus County Hazard Mitigation Vision

To create a spirit of cooperation and shared mitigation goals between local municipalities and Cattaraugus County. Also, to spotlight individual mitigation actions within unique locations.

5.3 Problem Statements, Goals, and Alternate Action Items

Now that each identified natural hazard that could affect Cattaraugus County has been profiled, and an estimation of potential future losses should an event occur has been calculated, an identification of appropriate mitigation action items and a strategy to implement them can be presented.

The next step for the development of the Cattaraugus County Multi-Jurisdictional Hazard Mitigation Plan was to take each natural hazard and address problems that could arise from each specific event. From these problem statements, goals were addressed for each hazard, and then objectives and action items were identified after reviewing web sites and other mitigation resources.

5.3.1 High Priority Natural Hazards

A. Ice Storms

Problem Statements:

- Freezing precipitation causes automobile accidents.
- Communications and power lines can be damaged resulting in loss of power
- Support structures can be damaged.
- Falling branches and trees.
- Freezing temperatures can cause problems with burst pipes, ruptured water mains.
- Fuel Shortage.
- Limited transportation, treacherous conditions, obstacles for downed trees and utilities.

Goal A1 – Reduce risk of damage to utility infrastructure in Cattaraugus County in the event of an ice storm event.

Objectives:

- Ensure utility lines are protected from ice storm related damage.
- Ensure falling trees during a severe storm event do not damage utility lines.
- Ensure improvement of emergency power and communication capabilities during an ice storm event.

Action Items:

A1.1 Prioritized list of utility lines shall be completed.

Goal A2 – Raise public awareness about ice storm events and how to respond.

Objectives:

- Ensure that clear and concise ice storm events data reaches 100 percent of the population in Cattaraugus County.
- Reduce health and safety risk to citizens regarding driving in winter conditions.
- Educate the public as to downed utility hazards.

Action Items:

A2.1 Map locations around the county that have the highest potential for an ice storm event using the existing county GIS system.

B. Severe Storms/Wind Hurricane Remnants

Problem Statements:

- Above ground utilities are prone to damage.
- Falling trees or falling branches damage structures due to improper or inadequate pruning.
- Utility and communication lines could be down for an undetermined amount of time.
- Utility outages resulting from severe storm events may cause damage to electronic items, perishable food items and place vulnerable and disabled citizens at increased health risk.
- There are limited tree planting educational programs or tree trimming / maintenance programs for private citizens.
- There is insufficient data on location(s) of disabled and elderly citizens who could be vulnerable to health risks as a result of power outages resulting from a severe storm event.
- Damage to structures from severe storm events, especially older buildings is significant because structures were built with inadequate regard for wind speed.
- Roofing and siding systems are not designed to resist hail and ice damage.
- No formal program is in place in Cattaraugus County for assessment of damage to structures after a severe storm event.

Goal 1 – Reduce risk of damage to utility infrastructure in Cattaraugus County in the event of a severe storm event.

Objectives:

- Ensure utility lines are protected from severe storm related damage.
- Ensure falling trees or branches do not damage utility lines during a severe storm event.
- Ensure improvement of emergency power and communication capabilities during a severe storm event.

Goal 2 – Raise public awareness about severe weather conditions and how to respond.

Objectives:

- Ensure clear and concise severe weather alerts reach 100 percent of the population in Cattaraugus County.
- Ensure power and communication capabilities are adequately improved for at risk citizens. The loss of electronics and perishable food items during severe storm events is minimized for seniors and the disabled.
- Minimize property loss/damage and personal safety risk due to falling tree damage following a severe storm event.
- Ensure a database containing the location and needs of the disabled and senior citizens is established and maintained.

Action Items:

- B2.1 Develop a program that can identify the location and specific physical assistance required during a severe storm event for disabled and senior citizens.
- B2.2 The project committee will seek information and funding in order to provide a reliable emergency wireless communication system for use by the elderly and disabled in the event of a storm event.

Goal 3 – Reduce losses to public and private structures in Cattaraugus County from severe storm events.

Objectives:

- Ensure that all residential and commercial building codes adopted throughout Cattaraugus County reference the most current standards for wind uplift.
- Ensure existing buildings and historically significant buildings are inventoried to identify potential losses from severe storm events.
- Encourage implementation of preventive measures for existing development to reduce the vulnerability to severe weather damage, such as the proper way to anchor mobile homes.
- Ensure mobile homes and mobile home parks throughout Cattaraugus County are inventoried to identify potential for losses from severe storm events.
- Initiate storm alerts earlier to allow citizens more time to prepare their structures for severe storm events.

Goal 4 – Broaden response capabilities of emergency forces in dealing with the aftermath of a severe storm event.

Objectives:

- Ensure there are damage assessment capabilities for emergency response personnel following a severe storm event.

C. Floods (Including Flash Floods)

Problem Statements:

- Flood warnings do not reach all citizens.
- Residents do not know what to do in the event of a flood.
- Motorists attempt to drive through flooded roadways.
- Pedestrians attempt to walk through flooded roadways.
- Residents are not aware they are in a flood zone.
- Poor storm sewer drainage causes flooding in low lying areas and roadways.
- Poor soil drainage in flood hazard areas.
- Debris carried by floodwaters can impact bridges, dams, culverts and utilities.
- Citizens are not informed about floodplain maps and regulations.
- Health risks associated with the cleanup.
- Water collects in low-lying areas such as some roadways, underpasses, neighborhoods and areas adjacent to creeks and streams.
- Lack of accurate map of the flash flood prone areas.

Goal 1 – Raise public awareness about flood hazards, flood safety, and flood damage protection measures.

Objectives:

- Periodically distribute flood hazard information to owners of flood-prone property and the general public. Information will include flood-prone areas (known locations of high water table), property owner responsibilities for streams, flood-proofing ideas, flood insurance, and flood safety measures.
- Develop and implement a public outreach and education program about stormwater management.
- Implement an educational program for local government with important flood fighting information.
- Make sure citizens understand floodplain maps and regulations.
- Make sure citizens understand potential health risks.

Action Items:

- C1.1 Evaluate areas that need a flood warning system constructed.
- C1.2 Continue the Thatcher Brook Task Force within the Village of Gowanda.

Goal 2 – Protect new and existing structures and infrastructure.

Objectives:

- Ensure the risk is reduced for high flooding risk properties, especially repetitive loss properties.
- Develop and implement a strategy for stabilizing stream channels in locations where bank erosion threatens development.
- See that Code Enforcement Officers receive periodic training to effectively enforce existing floodplain development regulations.
- Ensure the county and local municipalities have detailed mapping of flash flood-prone areas.

Action Items:

- C2.1 Develop a plan for inspecting and maintaining storm drains.
- C2.2 Educate citizens on the need to keep storm drains clear of debris.
- C2.3 Evaluate road elevation and culvert sizing standards for construction upgrades on all county, town, and village roads.
- C2.4 Survey all floodplain areas adjacent to creeks and streams to develop a list of flash flood prone areas.

Goal 3 – Improve Cattaraugus County’s ability to respond to flooding and minimize the impact when flooding does occur.

Objectives:

- Make sure local governments have adequate and updated flood response action plans.
- Implement a flood warning communication system between the county and local governments.

Action Items:

- C3.1 Project committee will investigate new ways to improve local municipalities' capabilities to report flooding, receive information, respond and request assistance.
- C3.2 Project committee will investigate the implementation of a communication system between local jurisdictions and the county with procedures describing warning systems.

Goal 4 – Ensure that streams, drainage ways, and drainage structures are maintained to minimize the potential for obstruction of flow.**Objectives:**

- Develop and implement a program for routine inspection and maintenance of streams, roadside ditches, and drainage-ways to reduce the potential for flooding caused by debris obstructions.
- Develop and implement a strategy for maintenance of privately owned stormwater drainage systems.
- Formalize the drainage system maintenance program and document inspection activities in order to maintain NFIP Community Rating System Credit for these activities.
- Ensure that water collection in critical areas is minimized following flash flooding events.
- Ensure current storm drainage systems can handle flash flooding events.

Action Items:

- C4.1 Project committee will investigate a plan for county, town, village, and city employees to perform routine inspections and maintenance of road ditches, culverts, streams, and other drainage features.
- C4.2 Project committee will develop a program to train property owners on how to maintain privately owned stormwater drainage systems.
- C4.3 Clean all ditches, streams and creeks in Cattaraugus County to allow for quick removal of excess water by the municipality or private owner.
- C4.4 Evaluate storm drainage systems, determine adequacy to handle flash flooding.

Goal 5 – Ensure that the Village of Gowanda Mitigation Plan is updated**Objectives:**

- To keep the public informed and interested in mitigation measures.
- To seek funding for mitigation needs.

Action Items:

- C5.1 Project committee will investigate a plan for county, town, village, and city employees to perform routine inspections and maintenance of road ditches, culverts, streams, and other drainage features.
- C5.2 Cattaraugus Creek Bank Stabilization project.
- C5.3 Point Peter erosion control.
- C5.4 Widen Thatcher Brook channel.
- C5.5 Diversion channel from Thatcher Brook to Cattaraugus Creek.
- C5.6 Feasibility study on hydraulic improvements by ACOE.

D. Winter Storms

Problem Statements:

- High winds can create zero visibility “white out” conditions.
- Heavy snowfall can reduce visibility to nearly zero, particularly in windy conditions.
- Heavy snowfall can disrupt delivery of Emergency Services when streets and sidewalks are closed.
- Heavy snowfall can cause damage to roofs of buildings.
- Freezing rain poses a significant risk to power lines and trees.
- Heavy snow can bring down trees and utility lines.
- Heavy snowfall affects the local economy when people are “snowed in”.

Goal 1 – Reduce health and safety risk to Cattaraugus County citizens in the event of future winter storm events.

Objectives:

- Implement an assistance program for potential at-risk citizens/residents.
- Educate citizens on the levels of snow winter storm warnings.
- Make citizens aware of alternate heating sources.
- Encourage families/individuals to have an emergency communications plan.
- Reduce health and safety risk to citizens regarding driving in winter conditions.

Action Items:

- D1.1 Identify potential at-risk citizens and/or residences and use the E911 system to contact those identified citizens/residents – Will be covered under Action Item B2.1
- D1.2 Coordinate with the American Red Cross to establish evacuation centers for at-risk citizens/residents – This has already been done.
- D1.3 Develop safety strategies for winter storm events in local driver education classes.

Goal 2 – Reduce potential of infrastructure damages from future winter storm events.

Objectives:

- Implement an informational program to encourage local utility companies to bury their transmission lines underground.
- Reduce risk to existing above ground utilities from trees that may be susceptible to damage during winter storm events.
- Make sure critical facilities have emergency communications plans and power backup plans.

Action Items:

- D2.1 Work with critical facilities to develop emergency communications plans and emergency power backup plans.

5.3.2 Medium Priority Natural Hazards

E. Wildfire/Fire/Drought

Problem Statements:

- Residents are unaware of wildfire risks because of the infrequency of large scale events.
- Public is not aware of, or do not obey all open burning laws.
- Area fire departments lack adequate training and equipment to handle a major wildfire.
- Residents are unaware of land management and landscaping options to limit fire spread.
- Builders and developers are uninformed of wildfire preventative and protection options.
- Water supply could be depleted during extreme drought.
- Livestock and agricultural losses occur during extreme drought.

Goal 1 – Reduce health and safety risk to Cattaraugus County residents in the event of future wildfires/drought.

Objectives:

- Make sure that residents are educated on hazards of wildfires, evacuation procedures, and open burning laws and penalties.
- Ensure that Fire Departments have improved capabilities for responding to and extinguishing wildfires.
- Ensure residents are aware of precautions to prevent spreading of fires.
- Provide adequate supply of water for the entire county during drought.
- Reduce risk of fire damage during extreme drought.

Action Items:

- E1.1 Increase media coverage of threat and evacuation procedures during peak wildfire times of the year.
- E1.2 Increase enforcement of existing open burning laws.
- E1.3 Expand training and awareness for fire departments in wildfire hazard areas.

Goal 2 – Reduce threat to existing and future structures from wildfires.

Objectives:

- Ensure that high and moderate wildfire risk areas are identified.
- Ensure that critical facilities and number of residential properties in high and moderate wildfire risk areas are identified.
- Ensure that building codes include fire resistant precautions.
- Ensure that wildfire vulnerability assessments are done.

Action Items:

- E2.1 Identify high and moderate wildfire risk areas and critical facilities.
- E2.2 Coordinate with all jurisdictions to develop a vulnerability assessment for wildfires.

5.3.3 Low Priority Natural Hazards

F. Tornado

Problem Statements:

- Limited emergency and medical relief to affected areas.
- Potential exists for death and/or serious injury.
- Major economic losses are possible from destroyed businesses resulting from a tornado event.
- Lack of public shelters.
- Poor public awareness of shelter locations.
- Older buildings not to current wind codes.
- Not all mobile homes anchored against tornado winds.
- Loose items become hazardous and dangerous during a tornado event.
- Health and safety hazards.

Goal 1 – Reduce safety risk to the Cattaraugus County community during the occurrence of a future tornado event.

Objectives:

- Provide tornado warning sirens in higher risk areas within Cattaraugus County.
- Provide adequate number of trained weather spotters.
- Educate the public to secure all loose items on decks, porches and in yards.
- Provide resident education regarding tornado protection and preparedness.
- Minimize the number of loose items that can become hazardous and dangerous during a tornado event.

Action Items:

- F1.1 Review public shelters and recommend new locations if and where they are needed.
- F1.2 Initiate weather spotter training courses and implement training within local fire and police departments.
- F1.3 Determine how to accommodate individuals with special needs, including complying with the American with Disabilities Act (ADA) regarding sheltering facilities and inclusion in emergency plans.

Goal 2 – Reduce losses from tornado events to present and future structures in Cattaraugus County.

Objectives:

- Ensure that existing mobile homes and older buildings having the most potential for losses from tornado events are protected.
- Ensure that all Cattaraugus County and municipal building codes reflect current standards for anchoring against straight line and tornado winds.

G. Ice Jams

Problems:

- They can be accompanied by severe flooding.
- Damage to low-lying areas and roads, bridges, culverts, buildings, and homes.
- Ice jams that fail rapidly can cause downstream flooding and erosion.
- Potential exists for death or serious injury because of flooding and rapidly changing conditions.
- Limits access by emergency and medical relief to affected areas.
- Can cause millions of dollars in damage.
- Damage riverine structures such as dams, bridges, dikes, levees, and wingwall, and decrease downstream discharge.
- Likelihood of eroded streambeds and banks.
- Little time to react to the situation or prevent costly damage.

Goal 1 – Reduce health and safety risk to Cattaraugus County residents in the event of future Ice Jams.

Objectives:

- Ensure that any residences in the identified flash flood-prone areas are protected.
- Periodically distribute flood hazard information to owners of flood-prone property and the general public.
- Make sure citizens understand floodplain maps and regulations.

Goal 2 – Reduce threat to existing and future structures from Ice Jams.

Objectives:

- Ensure that existing significant structures and critical facilities having the most potential for losses from an ice jam event are protected.
- Periodically monitor ice build up levels.

Action Items:

- G2.1 Identify existing significant structures and critical facilities that have the most potential for losses from an ice event.
- G2.2 Investigate an Ice Control Plan.
- G2.3 Hire consultant to design an Ice Jam Data Collection program.
- G2.4 Investigate the establishment of a policy to periodically observe and record ice buildup.

H. Dam Failure

Problem Statements:

- Flooding happens suddenly in a short period of time.
- Damage to buildings, bridges, culverts, roads and utilities.
- Severance of communications.
- Disruption of supply and delivery mechanisms and transportation.
- Emergency aid to recovering economy.

Goal 1 – Reduce health and safety risk to Cattaraugus County residents in the event of future dam failures.

Objectives:

- Ensuring that dams are properly maintained.
- Ensure that there is an emergency plan in place.
- Ensure that there is an evacuation plan in place.
- Complete a Dam Risk Assessment for each site.

Action Items:

- H1.1 Train individuals to increase inspection expertise and dam safety.
- H1.2 Develop and implement an emergency plan and evacuation plan for a potential dam failure.
- H1.3 Sponsor public workshops.
- H1.4 Complete a Dam Risk Assessment for each site.

Goal 2 – Reduce threat to existing and future structures from dam failures.

Objectives:

- Encourage acceptable engineering policies and procedures to be used for dam site investigation, design, construction, operation and maintenance, and emergency preparedness for private dams.

Action Items:

- H2.1 Review flood-operating procedures for non-government dams.

I. Earthquake

Problem Statements:

- Public is neither aware of nor prepared for the impact of a moderate earthquake.
- Older buildings will experience failure of aging fascia and are more susceptible to collapse in a moderate earthquake.
- Modern large span unsupported trusses are susceptible to collapse.
- Disruption of roadways and rail lines due to ground movement.
- Damage to underground utilities and services.
- Potential for failure of dams and impoundments.
- Transportation Disruption.

Goal 1 – Reduce the damage to private property and infrastructure in Cattaraugus County in the event of an earthquake.

Objectives:

- Make sure the possibility of future damage to private homes is minimized.
- Address inadequacy of current building codes for large structures.
- Make sure future damage to underground utilities and services, electric grid, natural gas, water and sewer lines, and communication networks are minimized.

Action Items:

- I1.1 Upgrade existing commercial/industrial building codes for large structures.
- I1.2 Improve system for isolating and re-routing utilities where possible.

Goal 2 – Reduce safety risk for all the citizens of Cattaraugus County before, during and after an earthquake event.

Objectives:

- Make sure the public is informed about the risk of an earthquake occurring in Cattaraugus County.
- Implement a plan to provide necessary services and information to the public in the event of a seismic event.
- Ensure emergency plans for underground utilities are up to date.
- Ensure that homeowners are informed of necessary measures to lessen the damage to their homes during an earthquake event.

Action Items:

- I2.1 **Develop emergency plans for underground utilities in the event that an earthquake occurs.**

J. Landslides

Problem Statements:

- Modern large span unsupported trusses are susceptible to collapse.
- Disruption of roadways and rail lines due to ground movement.
- Damage to underground utilities and services.
- Potential for failure of dams and impoundments.
- Transportation Disruption.

Goal 1 – Reduce the damage to private property and infrastructure in Cattaraugus County in the event of an landslide.

Objectives:

- Make sure the possibility of future damage to private homes is minimized.
- Make sure future damage to underground utilities and services, electric grid, natural gas, water and sewer lines, and communication networks are minimized.

Action Items:

- J1.1 Property acquisition on the Town of New Albion due to creek bank erosion.
- J1.2 Soil study in the Town of New Albion due to creek bank erosion.

K. Land Subsidence

Problem Statements:

- Disruption of roadways and rail lines due to ground movement.
- Damage to underground utilities and services.
- Potential for failure of dams and impoundments.
- Transportation Disruption.

Goal 1 – Reduce the damage to private property and infrastructure in Cattaraugus County in the event of land subsidence.

Objectives:

- Make sure the possibility of future damage to private homes is minimized.
- Make sure future damage to underground utilities and services, electric grid, natural gas, water and sewer lines, and communication networks are minimized.

Action Items:

- K1.1 Road Reconstruction and culvert replacement project on Youngs Rd in the Town of Coldspring where it crosses Hotchkiss Creek.

5.3.4 Common to all Hazards

After review, some action items are common to all participants and all hazards. The Cattaraugus County Hazard Mitigation project committee will address them.

- L.1 Review local ordinances and codes to meet the objectives of this plan.
- L.2 A Community Awareness initiative will be launched to inform and teach the public about the objectives of this plan. The project committee will meet with Public Access Television, Emergency Services, National Weather Service, insurance companies, Health Department and the Planning Department to prepare materials. It will disseminate information prepared by the NY State Emergency Management Office and National Weather Service for “Severe Weather Awareness Week” in March and “Winter Weather Awareness Week” in October. The Committee will distribute literature to the general public educating them on proper tree planting techniques as well as other material appropriate to mitigation goals and objectives listed below.
- L.3 Training for all municipalities within Cattaraugus County in Floodplain Administration.
- L.4 Support the countywide flood mapping update.
- L.5 Develop a countywide Flood Vulnerable Bridge Action Plan.
- L.6 Develop an early warning system countywide.
- L.7 Develop a listing of historical and architecturally significant buildings, as well as review the list of critical facilities that might suffer damage.
- L.8 Initiate damage assessment training for emergency response personnel to include building inspections, electrical, plumbing and heating.
- L.9 Develop a listing of mobile homes and trailer parks.

5.4 State and Local Mitigation Capabilities

The Project Group has been actively working with local municipalities to identify measures effective in mitigation. The geography of Cattaraugus County varies widely with small mitigation needs known only at the local level. Through a variety of outreach methods, Cattaraugus County has been actively encouraging the local municipalities to incorporate mitigation into their daily activities. As a result, curiosity and support for mitigation policies has increased across the county.

Through the development of this Multi-Jurisdictional Hazard Mitigation Plan, all partners have committed to action item L.1, the review of their existing local ordinances that are currently in place and to update them to include hazard mitigation. Cattaraugus County actively encourages the review, updating, and use of already established building codes, zoning ordinances, land use plans (current and potential future land use), emergency plans, as well as capital improvement plans in hazard mitigation. The Cattaraugus County Project Group provides technical assistance in incorporating these and other planning tools into the mitigation process. For instance, future changes to the zoning or land use regulations or changes to the comprehensive development plan will consider hazard mitigation philosophy and be consistent with the requirements of the multi-hazard mitigation plan. A list of mitigation implementation tools already in use by the local governments is included in Appendix A, page 2.

The primary county agencies in Cattaraugus County responsible for mitigation activities is the Cattaraugus County Department of Public Works and Cattaraugus County Department of Emergency Services. The Department of Emergency Services serves as the conduit for all state and federal programs and funding for mitigation activities, as well as disaster response planning and execution.

Cattaraugus County is an integral part of the New York State Highway Emergency Task Force which includes the Local Highway Emergency Task Force. The Local Highway Emergency Task Force will monitor the activities of the County Emergency Operations Center(s) to ensure that all highway emergency activities are proceeding rapidly in the affected area(s). The task force will also identify needs, establish priorities and deploy resources for the area(s) affected by the event.

County departments having degrees of responsibility for mitigation activities include:

- Cattaraugus County Director of Engineering (also serves as Hazard Mitigation Coordinator for Cattaraugus County) – Responsibilities include county road maintenance, snow and ice control, responsible for bridges and culverts on the county highway system and oversees design and construction of new county-owned facilities.
- Cattaraugus County Emergency Services – Oversees and coordinates all Emergency Plans within the county. Provide training and support for various activities.
- Cattaraugus County Legislature – Oversees the use of planning dollars for the county's Capital Program and Five-Year Program.

- Cattaraugus County Soil & Water Conservation - Programs and grants used for preserving natural resources within the county, as well as education and technical assistance.
- Cattaraugus County Department of Economic Development, Planning & Tourism – Responsible for reviewing and approving development throughout the county to make sure any new developments comply with the county and local development regulations.
- County Sheriff, local police and fire departments – Provides first responder response to incidents, educational programs on prevention and enforcement of laws within the county and local jurisdictions.
- Town Highway Departments – Responsible for maintenance of local roads, responsible for bridges and culverts on local highway system, and snow and ice control.
- City of Salamanca – Responsibilities include snow and ice control, leaf collection, maintenance of city streets, maintenance of storm sewers, and sidewalk maintenance.
- City of Olean – Responsibilities include city street maintenance, snow and ice control, responsible for bridges and culverts within city limits.
- New York State Department of Transportation – Responsibilities include snow and ice control, maintenance of state roads, responsible for bridges and culverts on state roads and on the Seneca Nation of Indians Reservation.

5.5 Mitigation Implementation Strategy

All action items were reviewed and prioritized using a STAPLEE Action Evaluation Table. A plus (+) sign was used to indicate items that were advantageous and a negative (-) was used to indicate items that were not advantageous. Particular attention was paid to the cost effectiveness of these action items. Using a percentage of positives to negatives a score was acquired to help rank the hazards with the higher the resulting score the more feasible the action item (Appendix E, page 1) and the higher the priority. These action items were then presented to the project committee and the individual municipalities through informal meetings, mailings, and telephone conversations. Each action item was then assigned a ranking of H – High, M – Medium, or L – Low priority based on the STAPLEE score, the ranking of the hazard covered by the action item, and the likelihood of danger to the public that the action item could mitigate (Appendix E, page 2.)

5.6 Mitigation Plan Adoption

On June 16, 2004 the Hazard Mitigation Coordinator for Cattaraugus County addressed the Public Safety Committee for Cattaraugus County on the development of the Multi-Jurisdictional Hazard Mitigation Plan. The Committee was advised that a draft plan will be submitted on July 16, 2004 for review and comment with revisions and approval scheduled for fall of 2004. In September of 2005 the first draft of the plan was received back from FEMA with required correction and revisions noted. A second draft plan was submitted to FEMA on February 3, 2006. On July 10, 2006 FEMA notified SEMO of their intention of approving the plan pending formal adoption by all participants. On August 22, 2006 a copy of the final plan and adoption resolution sample were sent to each participant.

5.7 Mitigation Plan Monitoring

Once the mitigation plan is adopted and in place, the plan will be monitored by the Project Group which will continue to consist of the Cattaraugus County Mitigation Coordinator, the Director of Cattaraugus County Emergency Services, and representatives from other county departments every quarter using a progress reporting form similar to FEMA 386-4, *'Bringing the Plan to Life, Worksheet #1'*, to track the progress of the mitigation action items. The chief elected official, or their representative, from any participating partner that has a mitigation action pending will also be included and will report on their project's progress.

Throughout the monitoring process, the public will be invited to participate and take an active role in the process. The Multi-Jurisdictional Hazard Mitigation Plan will be available not only on the county web site, but also at various locations throughout the county. The public will be invited to participate in the required update process and also be given the opportunity at any time to make comments on the plan.

5.8 Mitigation Plan Evaluation

Every December the plan shall be evaluated with a form similar to FEMA 364-4, *'Bringing the Plan to Life', Worksheets #2, #3, and #4* as to whether :

- goals and objectives address current and expected conditions
- the nature or magnitude of risks have change
- current resources are still appropriate for implementing the plan
- outcomes have occurred as expected
- agencies and other partners participated as originally proposed

5.9 Mitigation Plan Update

The plan shall be updated by the project committee consisting of the Cattaraugus County Mitigation Coordinator, the Director of Cattaraugus County Emergency Services, and representatives from other county departments as required. Participating partners will be notified and asked to attend the meetings for their input. Additional information as it becomes available will be reviewed and revised into the plan using a form similar to FEMA364-4 *'Bringing the Plan to Life', Worksheet #5*. The plan may be updated annually if warranted, but will be updated at no less than the five-year intervals as required by DMA2K. Revisions to this plan may include updates to existing local planning mechanisms such as building codes, land use plans, floodplain regulations, zoning codes, etc.

Every time the plan is revised the public will be notified with press releases, information on Public Access Television, website notices, and radio announcements of the fact. The public will always be asked for comments and suggestions.

6.0 Plan Maintenance Process

The mission of the Cattaraugus County Hazard Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural hazards. This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention and identifying activities to guide the county towards building a safer, more sustainable community. As part of the plan maintenance process, the following will be done:

- The plan will be updated whenever conditions change that may affect the plan.
- During the review and update of this plan, capital projects and the five-year plan for Cattaraugus County and other municipalities will be taken into consideration.
- The Planning Committee will solicit public input and comments each time that this plan is revised.
- The media can be used to encourage public involvement including municipal websites, newspaper articles, posting notices in municipal offices and directly contacting potential interested individuals.

The Cattaraugus County Department of Planning, Tourism and Economic Development will be asked to review each revision of the Cattaraugus County Multi-Jurisdictional Hazard Mitigation Plan prior to submission to the Cattaraugus County Legislature and each participating local municipality's boards for adoption.

Each time the Cattaraugus County Multi-Jurisdictional Hazard Mitigation Plan is revised, the contents will be reviewed with the Seneca Nation of Indians, town boards, village board of trustees, city councils and municipal staff. Once all recommended changes are considered and incorporated, all local jurisdictional participants will then formally adopt the revised plan.

The plan revisions will then be incorporated into all copies of this document, including those posted on the municipal websites and noted in CEMP revisions.

6.1 Protect Life and Property

- Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural hazards.
- Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards.
- Improve hazard assessment information to make recommendations for discouraging new development and encouraging preventative measures for existing development in areas vulnerable to natural hazards.

6.2 Public Awareness

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.
- Provide information on tools, partnership opportunities, and funding resources to assist in implementing mitigation activities.

6.3 Natural Systems

- Balance watershed planning, natural resource management, and land use planning with natural hazard mitigation to protect life, property, and the environment.
- Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions.

6.4 Partnerships and Implementation

- Strengthen communication and coordinate participation among and within public agencies, citizens, non-profit organizations, businesses, and industry to gain a vested interest in implementation.
- Encourage leadership within public and private sector organizations to prioritize and implement local, county, and regional hazard mitigation activities.

6.5 Emergency Services

- Establish a policy to ensure mitigation projects for critical facilities, services, and infrastructure. Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, businesses, and industry.
- Interactive video links between key emergency centers.
- In-Transit Display Technology.
- Fax capabilities on a lap top computer in emergency vehicles to receive items during emergency responses such as building blueprints and maps.
- Satellite uplink and downlink capabilities for the region's mobile emergency response command center that would incorporate the interactive video links and fax capabilities as mentioned above.