INDIANA SILVER JACKETS
NORTH BRANCH ELKHART RIVER
WEST LAKES TASK TEAM

DETAILED SUMMARY

Summary

Many different, and sometimes opposing, water resource related concerns typically are found within any watershed/drainage basin due to the varying perspectives of the many stakeholders.

The North Branch Elkhart River (NBR Elkhart River) watershed/drainage basin is no exception. As explained in this report, basin geology and topography, the hydrologic cycle, natural resources stability, water quality, flood risk, seasonal access, and historic and future land use planning, are all interrelated issues.

The focus of this report — seeking ways to reduce flood induced risks in the West Lakes Chain area — was an intentionally unbiased and broad vision. In order to adequately address flooding issues on the West Lakes Chain, it was seemingly apparent this Report include information on the many water resource related variables found in the entire NBR Elkhart River watershed/drainage basin.

In a group effort, from all contributing authors to this report, the following highlights were compiled:

Purpose and Scope of Report:

- A recent extended period of above normal precipitation resulted in multiple flooding events in 2008 and 2009 in northeastern Indiana. Those flood events have again raised community interest in understanding and seeking ways to reduce flood-induced risks, specifically in the West Lakes Chain area.
- Unless otherwise stated, all elevations used in this report are referenced to the National Geodetic Vertical Datum of 1929, NGVD '29.

Chapter 1 – Overview of Previous Reports:

- Two 1980's reports stated that flooding in this watershed can be attributed to a combination of several factors, with the major cause being the construction of structures in the floodplain, many at or below the base flood elevation.
- In past reports (through 1983), many floods are referenced: 1969, 1974, 1976, 1978, 1981, and 1982.
- There is a large quantity of useful information and data already compiled and available for use in continued efforts to improve this watershed.

Chapter 2 – Physical Setting:

- The unique, physical and geological landscape of the NBR Elkhart River watershed/drainage basin provides an abundance of naturally existing flood storage and natural flood peak reduction.
- Because the NBR Elkhart River watershed/drainage basin has an abundance of natural storage (wetlands/geologic features), it has the ability to detain significant volumes of water for slower release, thereby reducing the peak elevation of flood waters in downstream channels, but flood flows may extend over longer periods of time.
- The primary reason lake levels can stay elevated for weeks, even while a substantial rate of flow is occurring out of the lakes, is because it can take time to drain the water from the extensive upstream storage, both wetlands and groundwater.
- The NBR Elkhart River has experienced stresses related to development, increased precipitation and concentration of runoff. However, with proper floodplain and watershed management, these stresses can be decreased over time.
- In spite of much alteration of the natural landscape over time (wetland draining/ditching, forest and riparian clearing, etc.), these activities do not appear to have dramatically altered the natural regional relationships between precipitation, geology, streamflow, groundwater, lake levels, and flooding for the NBR Elkhart River watershed/drainage basin.
- The NBR Elkhart River does not appear to be in a severely degraded condition, requiring major restoration.
- When compared, other similarly sized basins in Indiana respond to rainfall in a faster and more intense manner (i.e., they are more "flashy"). Runoff in such systems occurs rapidly with high flows over a short period of time. It appears that wetlands and upland storage play an important role in this difference in flood response.
- Protection of existing wetlands and upland storage should be a priority in the NBR Elkhart River watershed/drainage basin.
- Fifty (50) years of long-term rainfall records indicate the annual precipitation received in the region is increasing.
- During lower flow and drier times in the summer months, in-channel aquatic vegetation in an area defined as the "transition area" may be slowing water flow. This summer slow flow may be what has been keeping the lake chain from reaching the legal average level over the past few wetter than normal years. It does not appear, however, that in-channel aquatic vegetation is a controlling factor during large flood events.

- The USGS gage data show the outlet channel can carry a large rate of flow during normal lake levels, and appears to respond appropriately to flood events by showing a substantial increase in flow.

Chapter 3 – Natural Resources:

- Many of the State's rarest wildlife and plant species can be found in the NBR Elkhart River watershed/drainage basin.
- Numerous acres of Dedicated Nature Preserve can be found in the NBR Elkhart River watershed/drainage basin.
- Based on Indiana Department of Environmental Management (IDEM) sampling data, high quality fisheries habitat still exists in the lower portion of the NBR Elkhart River
- Based on IDEM data, there are impaired waters in the NBR Elkhart River watershed/drainage basin.
- Many practices that can improve water quality also have a positive impact on flood reduction by providing storage.
- Opportunities for conservation/best management practices can address several water resource related issues.
- Private partnerships have been used in the area to protect natural lands, and other opportunities for these partnerships should be sought.

Chapter 4: Lake Level Establishment, Structures, and Data

- Lake level outlet works for public freshwater lakes with court established lake levels function to assist in preventing or decreasing the impacts of low lake levels associated with drought or drought-like periods that frequently occur during the peak recreational season.
- Lake level outlet works typically are designed not to be restrictive and not to add flood storage.
- USGS gage data indicates that within the last 50 years, unlike Sylvan Lake and the Indian Lakes Chain, the West Lakes Chain has not seen a flood event that is equal to or exceeds the 1 percent annual chance (100-year) event.
- Additional gages in the watershed to record data related to rainfall, stream flow, and water levels would be helpful to track trends and could be used for future analysis and modeling calibration.

Chapter 5: Review of Local Floodplain Management Activities

- Throughout the nation, floodplain regulation is approached through a combination of federal, state, and local laws and ordinances.

- Within the NBR Elkhart River watershed, Noble County (unincorporated), Kendallville, Rome City, and LaGrange County (unincorporated) all participate in the National Flood Insurance Program.
- Misunderstandings about the National Flood Insurance Program are common.
- Only 201 homeowners in Noble County (unincorporated) purchase flood insurance through the National Flood Insurance Program.
- The minimum requirements for construction standards in floodplains often do not provide sufficient protection from all local flood hazards, nor do they account for the effects of development on future flood levels. Noble County has adopted a more restrictive standard in regards to compensatory storage requirements.
- Since 1991, Presidential Declarations (flood) for Noble County include: January 1991, September 1992, July 2003, May/June 2004, January/February 2005, January 2008, and March 2009.
- Within the identified North Branch Elkhart River/West Lakes Chain area of concern, 303 structures currently exist within the area of the 1 percent annual chance (100-year) floodplain. Of those 303 structures (primarily residential), 121 (36 percent) are located within areas also included in 50 percent annual chance (two-year) floodplain. Many of these structures were built prior to the adoption of local floodplain ordinances.
- Seasonal road access difficulties may be a more of a local concern than flood related property damage.
- A recent local survey found over half of the respondents showing interest in pursuing more information about buyouts that would allow residents to relocate to areas outside of the floodplain.
- The best method to reduce flood risk and eliminate property damage and loss is to allow known flood prone areas to remain undeveloped and either remove or relocate existing development to safer sites.
- Typical flood prediction modeling does not take into account or have a factor of safety against unpredictable events such as multiple smaller storms occurring consecutively before basins dry out, storm events that exceed the 1 percent annual chance (100-year) size, debris jams at bridges, or ice jams.
- Sylvan Lake Dam is a high hazard dam and has an Emergency Action Plan maintained by the Rome City Conservancy District. There is a need for Emergency Flood Response Planning for downstream residents during the potential operation of the structure in an extreme flood event.

Chapter 6: Engineering Project Considerations:

- An Engineering Review shows that existing downstream structural features (the dams at Benton and Goshen) have no impact on discharge flows from the NBR Elkhart River and lake levels at West Lakes Chain.
- Many previous debris and downed tree removal projects have occurred in the lower portion of the NRB Elkhart River. However, these projects alone did not and will not provide a permanent solution to flooding on West Lakes Chain.
- Actions to substantially increase outflow from any lake in the basin (in order to minimize flood level increase on that lake) will have adverse consequences to other downstream lakes and streams.

- Sylvan Lake contributes approximately only 25 percent of the total area that drains into the West Lakes Chain.
- If proposed activities are reviewed only from the perspective of their immediate surroundings, there seems to be an appropriate concern that unintended detrimental and cumulative consequences may occur elsewhere within the basin.

Chapter 7 – Agency Resources and Stakeholder Partnerships:

- Many post disaster grant opportunities exist for mitigation actions related to flood damage reduction and elimination, some of which are time sensitive.
- There are many Federal and State grant and cost-sharing programs available to address water related issues.
- Opportunities for public/private partnerships for protection of natural lands, regional planning, and lake management are available.

Future Local Actions and Considerations

The following future local actions and considerations were compiled and suggested through majority consensus of the contributing authors to this report.

These actions are presented in four (4) main categories:

1) Long-term elimination and/or reduction of flood related risks.
2) Shorter-term reduction of flood related risks.
3) Physical and/or structural "on-the-ground" activities to help decrease flood related risks and keep flooding from getting worse while the activities in category 1 and 2 are being considered.
4) Long-term local planning activities to assist in performing and properly maintaining activities considered in categories 1, 2, and 3.

CATEGORY 1: Long-Term Flood Elimination/Reduction

Priority	**Future Action or Consideration** **Chapter Reference*	**Remarks, Performance Steps, or Objectives**
1	Pursue Federal and State grants to initiate a volunteer home acquisition and relocation program for homes located in the most vulnerable flood prone areas. **Chapters 5, 7*	Create and implement an acquisition / relocation program for willing sellers. Identify the lowest and most flood damage vulnerable areas and begin program in those areas. Identify upland areas available for relocation that can use the existing regional sewer utility. This is the only solution for removing flood risk for residents with a structure currently located in a high risk area.

CATEGORY 2: Shorter-Term Reduction Of Flood Related Risks

Priority	Future Action or Consideration **Chapter Reference*	Remarks, Performance Steps, or Objectives
1	Continue to work with homeowners to properly elevate flood prone homes and pursue additional funding opportunities for this activity. **Chapters 5, 7*	Seek available grant opportunities to fund elevation of existing structures. Consider ways to create incentives for privately funded home elevation projects. This activity will not fully remove flood risk for the structure or residents.
2	Flood Warning System **Chapters 5*	Reinvigorate the existing flood warning system. Routinely test, educate residents about, and seek opportunities to expand the system. Develop an Emergency Flood Response Plan, including evacuation planning, to be tested with the Sylvan Lake Emergency Action Plan.
3	Increase flood insurance coverage **Chapter 5*	Through public outreach, seek to provide education regarding the national flood insurance program. Explain typical costs, benefits, flood risks, and attempt to dispel myths regarding this type of insurance.
4	Elevate water well heads **Chapter 5, Appendix 9*	Work with homeowners, local health officials, or local zoning officials, to upgrade protection for water well heads located in a flood hazard area.
5	Anchor propane tanks (need to add to report)	Work with homeowners, local zoning officials, and local energy providers to anchor propane tanks located in flood plain areas.
6	Address flood prone access roads. **Chapters 5, 6*	Inventory and prioritize those areas where seasonal road access difficulties exist. Prepare a plan to reduce the access issue for the more vulnerable areas.

CATEGORY 3: Physical/Structural Activities

Priority	Future Action or Consideration **Chapter Reference*	Remarks, Performance Steps, or Objectives
1	Protect existing and historical, natural flood storage areas **Chapters 2, 3, 6, 7*	Create an inventory of natural areas that currently and historically provided natural storage and detention in the watershed/drainage basin. Seek funding and partnership opportunities to protect and/or restore these areas from future development.
2	Limit fertilizer, nutrient, and sediment loading. Target the "transition area" of the river. **Chapters 2, 3, 7*	Work with landowners, home owners, land management contractors, public utilities, and local agriculture agency officials to seek, construct, and implement conservation practices to limit fertilizer, nutrient and sediment loading. This is especially important for streams and drains discharging directly into the "transition area" identified in Chapter 2.
3	In-channel aquatic vegetation control in "transition area" described in Chapter 2. **Chapters 2, 3, 6, 7*	Once the source of nutrients is addressed, contact regulatory agencies to discuss authorizations needed to conduct in-channel aquatic vegetation removal at the "transition area" identified in Chapter 2.
4	Maintain existing streams using best management practices.	Work with local officials, adjoining property owners, recreation groups, and volunteer groups to fund and/or conduct routine stream maintenance and drainage projects consistent with the Indiana Drainage Handbook. For example, use volunteers to

	**Chapters 3, 6, Appendix 1*	periodically remove downed trees to prevent them from accumulating over time and becoming substantial log jams.
5	Clear span at 900N bridge **Chapter 6*	With the proper approvals, remove the obstruction associated with the outlet pipe that is protruding into the bridge waterway opening downstream of the bridge. Review the original configuration of the waterway opening under this bridge and the flow approach areas, and seek to restore the original flow area.
6	Increase gage network in basin **Chapters 4, 6*	Installing and maintaining new gages to expand the coverage of documentation could prove useful to a broad base of stakeholders. Discuss partnering opportunities with the U.S. Geological Survey, and the National Weather Service.

CATEGORY 4: Long-Term Local Planning

Priority	**Future Action or Consideration** ****Chapter Reference***	**Remarks, Performance Steps, or Objectives**
1	Strengthen regional leadership regarding floodplain management practices	Create and/or strengthen an existing local group to be regional administrator of floodplain management practices (covering the communities and counties that are part of the NBR Elkhart River watershed/drainage basin). Develop consistent basin wide practices, seek, and be the local administrator for grant opportunities. Use this group to consider the

		activities in the remainder of this category.
2	Flood-related Public Education and Outreach **Chapter 7*	Organize a flood related public education and outreach event for the NBR Elkhart River watershed/drainage basin stakeholders. Provide a forum-style question and answer area with information tables, displays, staff from various Federal, State, Regional, and Local water resource agencies, and local officials. Routinely provide public outreach and education activities.
3	Identify and gather data for grant opportunities **Chapter 7*	Identify an experienced grant writer to gather data and help prepare grant applications.
4	Create a long-term strategic improvement plan	Develop a long-term strategic improvement plan to begin reducing flood risk for the basin. The strategic planning process would be founded upon a review of the North Branch Elkhart River basin's strengths, opportunities, weaknesses, and threats. A typical strategic plan would then identify and prioritize goals with measurable objectives set for each goal. Yearly action steps would then be outlined to begin addressing the many likely objectives. To be effective, the strategic planning creation, vision, and implementation must have the involvement and commitment of the local stakeholders.
5	Prepare detailed "unsteady flow" basin hydrologic and hydraulic model	Seek funding to create a detailed, calibrated, basin-wide hydrologic and hydraulic engineering computerized flow and flood level prediction model

	**Chapter 6*	(an unsteady flow model). The creation and maintenance of these models can be used to more accurately predict and assess the benefits, disadvantages, and cumulative effects of any future proposed construction or development activities within the basin.
6	Utilize and strengthen existing ordinances **Chapter 1, 5*	Ensure consistent regional use of flood plain management and storm water ordinances. Seek to strengthen these ordinances to incorporate best management practices.
7	Seek sustainable growth **Chapter 1, 5*	To minimize future disruption to local business and area employment, seek to locate future economic growth opportunities in pre-planned, low risk zones, where natural hazards such as floods would not jeopardize the local business growth. Limit and, if possible, prohibit construction of new critical structures and utilities in flood hazard areas.

Conclusion of the Silver Jackets North Branch Elkhart River, West Lakes Task Team

The initial work concept (now complete) of the voluntary efforts from the Silver Jackets North Branch Elkhart River West Lakes Task Team initiative included:

- Participation in local meetings
- Regular Task Team member meetings
- Several tours of the area of concern by the team and local stakeholders
- Gathering of existing information such as the many previously published reports, historical hydrologic data including precipitation, lake level, stream-flow, and flood peak data, topographic data, and structure/infrastructure information
- Research on existing resources for potential flood-loss mitigation
- Synthesis of all Task Team findings and future local considerations for presentation to stakeholders and for the production of this report

- Development of these written Task Team findings and prioritized future local considerations which could lead to basin-wide reduced flood risks.

The voluntary efforts of the Silver Jackets North Branch Elkhart River West Lakes Task Team end with this report.

Locally led efforts to implement much of the guidance supplied by this document will require interaction with several of the contributing agencies represented by this Silver Jackets Task Team, as well as pursuing opportunities for private partnerships.

The many Federal, State and local agencies that participated have expressed their appreciation for this opportunity to work collaboratively and with the Flood Focus Committee of the Elkhart River Alliance on this regional water resource issue. They welcome the opportunity to assist, through their existing programs, in the local efforts to reduce flood risk.