

Michigan's Regulatory Approach to Critical Dune Protection

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ABSTRACT

Michigan's Critical Dune Area (CDA) program protects approximately 74,000 acres of the state's most fragile dunes through a regulatory approach by: avoiding impacts to steep, unstable slopes; minimizing vegetation removal; minimizing contour changes; and identifying alternative site designs that reduce impacts associated with developmental, recreational, and silvicultural activities. The CDA program, which requires permits for most construction projects and terrain alterations, is administered by staff of the Michigan Department of Environmental Quality's Land and Water Management Division under the authority of Part 353, Sand Dune Protection and Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Increasing developmental pressures combined with decreasing staff resources require greater efficiency in tracking and management of these sensitive areas. Therefore, Geographic Information System (GIS) tools as well as Global Positioning System (GPS) technology have been, and will be, an increasingly essential component of evaluating environmental impacts and ensuring compliance with the statute. While the CDA program is largely successful at reducing impacts at the site level, the regulation of these extremely valuable private lands is often challenging. Difficulties remain in addressing high-density development that often results from inappropriate land division control, thereby causing the fragmentation of sensitive dune lands.



BACKGROUND

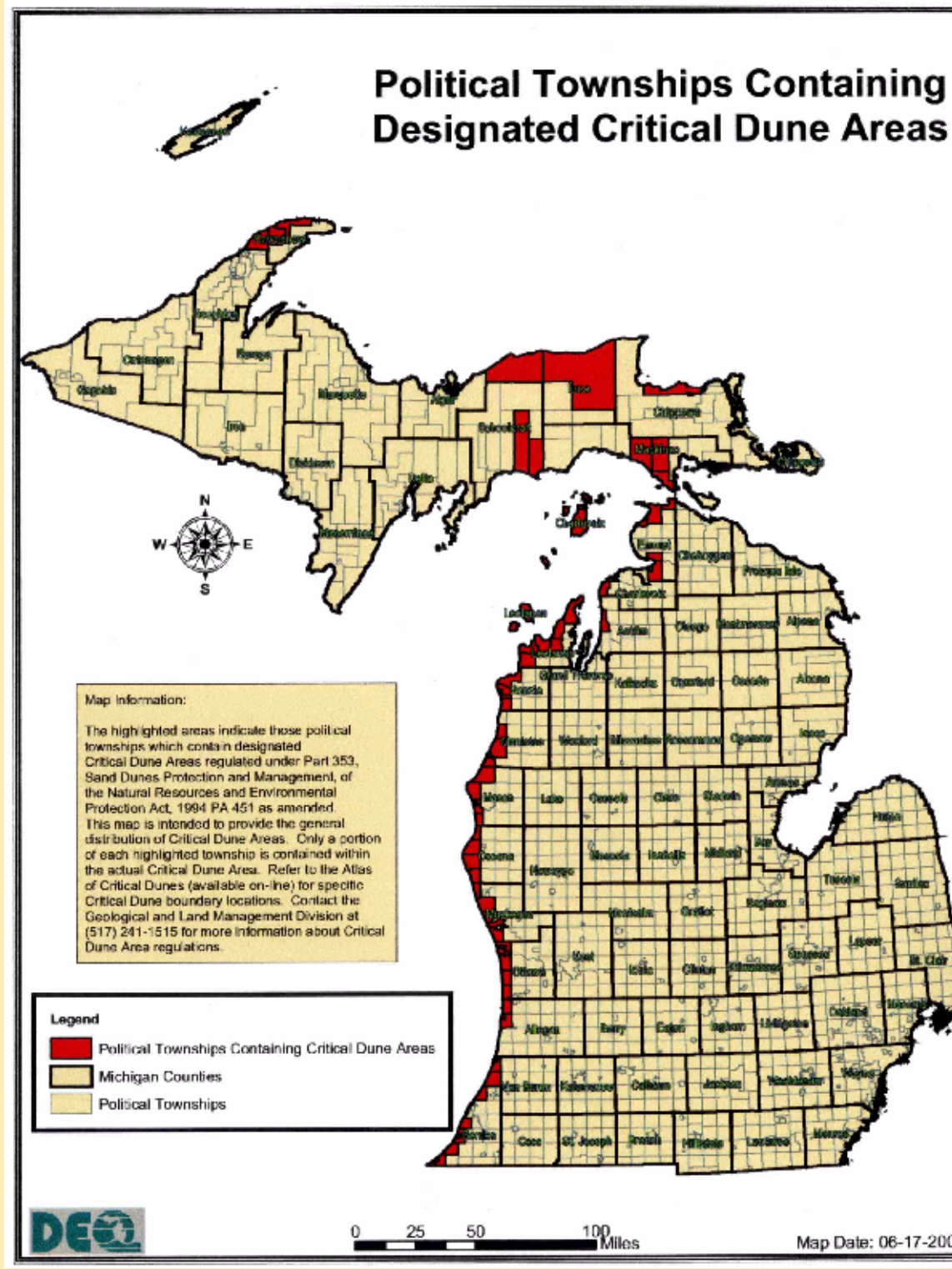
In 1989, the Michigan legislature amended the Sand Dunes Protection and Management Act (1976 PA 222) with the passage of PA 146 and PA 147. These amendments broadened the scope of the original act to include regulation of residential, commercial and industrial development in designated critical dunes. This is now Part 353, Sand Dunes Protection and Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Legislative findings within the act (MCL 324.35302) include:
(a) The critical dune areas of this state are a unique, irreplaceable, and fragile resource that provide significant recreational, economic, scientific, geological, scenic, botanical, educational, agricultural, and ecological benefits to the people of this state and to people from other states and countries who visit this resource.

(b) Local units of government should have the opportunity to exercise the primary role in protecting and managing critical dune areas in accordance with this part.

(c) The benefits derived from alteration, industrial, residential, commercial, agricultural, silvicultural, and the recreational use of critical dune areas shall occur only when the protection of the environment and the ecology of the critical dune areas for the benefit of the present and future generations is assured.

CRITICAL DUNE AREA LOCATIONS AND REGULATED ACTIVITIES



- Regulated activities include:
- New house
 - Additions (first floor)
 - Driveway
 - Well
 - Septic system
 - Garage
 - Swimming pool
 - Deck
 - Porch
 - Sand removal
 - Terrain alteration
 - Utilities
 - Vegetation removal
 - Retaining walls

DEQ
CDA Maps available on-line at:
www.michigan.gov/deqsanddunes

PROHIBITED USES IN A CDA (SECTION 324.35316)

- Unless a variance is granted the following cannot be permitted:
- Structure on slopes between 25% and 33 1/3%, unless sealed plans are provided.
 - Use on a slope steeper than 33 1/3%.
 - Contour change likely to increase erosion, decrease stability, or more extensive than required.
 - Silvicultural practices likely to increase erosion, decrease stability, or more extensive than required.
 - Vegetation removal likely to increase erosion, decrease stability, or more extensive than required.
 - A use not in the public interest. Must consider:
 - Availability of feasible and prudent alternative locations or methods, or both, to accomplish the benefits expected from the use.
 - Impact to the critical dune area, and the extent to which the impact may be minimized.
 - Structure on the lakeward side of the dune crest; if located within 100', the following must be demonstrated:
 - Use will not destabilize the critical dune.
 - Contour changes and vegetation removal limited to those that are essential.
 - Access from landward side.
 - Restabilized with indigenous vegetation.
 - Construction techniques/methods mitigate dune impacts.
 - Dune crest not reduced in elevation.

FIELD REVIEW

- During site inspection field staff:
- Delineates dune crest
 - Measures distance from crest to proposed structures
 - Measures inclination of slopes to be impacted
 - Documents vegetation impacted by proposal
 - Determines whether impacts are more extensive than necessary



- Recent efforts have been made to minimize impacts by:
- Regulating all deck proposals
 - Regulating all appurtenant structures (e.g. sheds, gazebos)
 - Allow cantilevered structures over steep slopes only through special exception
 - Limiting length and width of driveways
 - Locate home close to access
 - Limit foundation footprint size
 - Minimize disturbance outside of building footprint
 - Minimize vegetation removal
 - Locate well and septic close to driveway
 - Eliminate new impacts from swimming pools, tennis courts, landscaping, etc.



UTILIZATION OF GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND GLOBAL POSITIONING SYSTEMS (GPS)

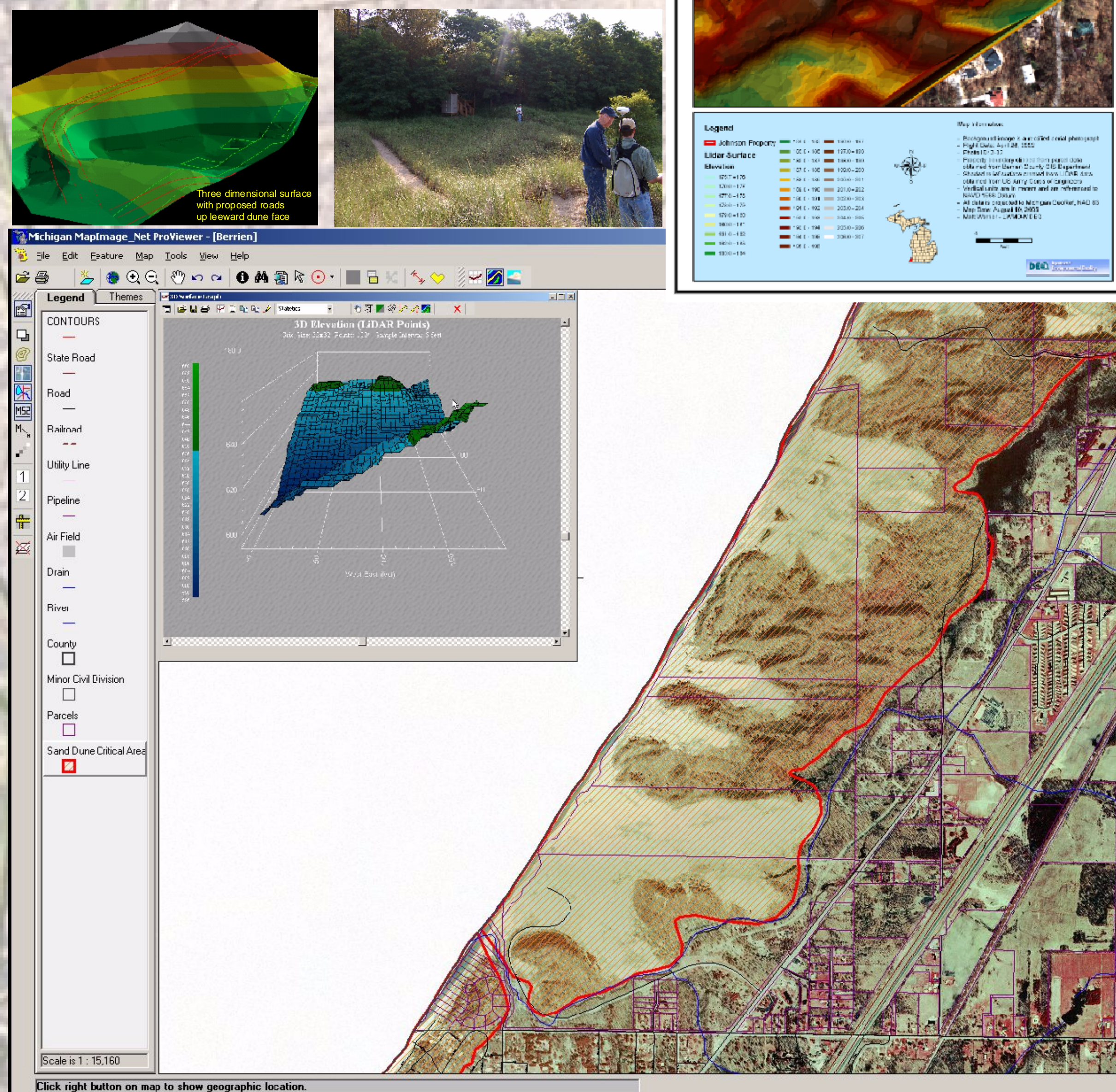
Working with Michigan State University's Department of Geography and Center for Remote Sensing and GIS to build a GIS-based decision support system for Critical Dune Management.

Developing "beta" GIS for tracking properties within the critical dune areas.

Utilize GIS/GPS technologies for creating exhibits supporting our position in administrative hearings.

Every Critical Dune field representative has access to a submeter Leica GPS.

- GIS technology utilized in critical dune protection includes:
- Submeter Leica GPS data collection
 - In-house ortho-rectification of aerial imagery (Leica Photogrammetry Suite)
 - LIDAR data (obtained from USACE)
 - Three-Dimensional GIS (ArcGIS 3-D Analyst)



CHALLENGES



Many challenges arise when regulating sand dunes that are held in private ownership including:

- Limited field staff time/resources
- Staff can't always catch violations,
- Staff cannot pursue compliance/enforcement issues as much as we would like.
- General fund cuts have required substantial permit fee increases
- Statutory language only (no administrative rules)
- Not written in plain english that is easy for public to understand
- Open to interpretation/debate
- Handling small parcels
- The state must issue permit for building on small parcels/lots of record which pre-date the statute or face the potential for a "takings".
- The parcelization into small lots can seriously fragment the dune ecosystem.
- While Part 353 provides for review of subdivision proposals, specific criteria (e.g. minimum lot size, density) do not exist.

