State of Michigan, Department of Natural Resources (DNR)   www.michigan.gov

DNR Wildlife Division (WLD) technical document:

Deer Wintering Complexes (DWC) Historical Data Sets

Durable descriptive data set and source / development notes, pro-forma metadata, individual data-set quick-view graphics, related data sets, etc. – with improvements being made as more notes possible.

Rev. 2021 May 12, by DNR Wildlife Division, M. Strong

Document Purpose: This document attempts to at least start to gather and define some known information on data set , layer or resources related to deer wintering areas and deer wintering complexes (DWC) with detail notes per data set (listed below).

Introductory Comments:

It is intended that this is a living authoritative documentation leading to formal geospatial metadata for the historical / legacy deer wintering areas or DWC.

This document will assist understanding either the individual data sets, such as when grouped as subfolders of "WLD_deer_wintering_complexes_dwc_legacy_data" folder name -or- when data sets are combined in one layer yet features clearly identified by data set name same as the name listed later in this document.

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Contents: (no page numbers as content under development, and page numbers were not auto-correcting correctly)

                         ? add table of figures, later -M.Strong

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Understanding This Documentation and Data Development Across The Various Data Sets

Important note on terminology: Until the 2000's, the argued and multi-definition term deeryards or "deer yards" was used with terms of "deer winter range" and "deer wintering areas" yet all these terms frequently had different meanings to different users or readers. The "deer yard" term was particularly argued at public meetings between different public attendees, lay-scientists or professional scientists and specialists, and more; problems with the terms resulted in misunderstandings and barriers to communications when those terms were used. The DNR Wildlife Division (WLD) staff saw the best way to communicate clearly was to define what DNR WLD staff meant when discussing deer winter areas,

and so defined and started using the concept of deer wintering complexes (DWC) to reflect the concept area identified as important browse food sources and shelter areas that deer use or occupy in winter, particularly during severe winters when those specific locations allowed or facilitated winter deer survival. The term deer wintering complex or DWC is well defined and has been shared as DNR-Wildlife Division (WLD) staff use this term in our work relating to important landscape feature locations, deer habitat, deer management, etc. The DWC term is defined later in this document.

DNR WLD upper management, in the past to current dates, have repeatedly stressed directions to avoid using the argue and unclear term "deer yard" for a more general term "deer wintering area" or the defined term "deer wintering complex" (DWC) where appropriate. However, "deer yards" has become a well entrenched and well-used term which is part contributing to the confusions, misunderstandings, and more.

For purposes of clearly communicating in this document and readers' understandings, readers need to firmly understand that terminology matters but use of those terms can vary both over time and regionally. Although data set names may list "deeryard" or "deer yard", which is done for appropriate naming based on the source hardcopy maps, etc., please understand as a reader that those terms are not uniform and may be identified by different methods or different viewpoints when local staff, wildlife biologists, or others looked at the landscape and used those terms. Even the terms "deer range" or "deer wintering area" have the same difficulties, over time and across different regions of the State, as "deer yards", when it's read that those are more proper terms versus relative descriptions. A safer starting point is considering these as more general descriptive terms, which allows grouping them and allows using the various data sets over time together for approximate comparative considerations.

As this documentation and later the detailed metadata develop, efforts will be made to improve clarity in what those terms mean specifically as relates to those areas identified in the specific data sets using those terms. Directly successive data sets for the same region during the past may not be using the same meaning for "deer yard" and may not use the same methodologies to identify those areas on the landscape, nor the same data resources (aerial imagery, site observations, etc.). For some data sets, particularly the oldest ones where complete project methodology and documentation may not be available, yet best efforts will be attempted while repeatedly warning and providing caveats and disclaimers in order to prevent misuse, confusions, or conflicts in the various data sets.

However, for the start we have to group those types of areas and basically cluster them all under the term "deer wintering areas" for delineated areas, locations or polygons related to deer during winter. This grouping and forgiving the possible and known variation in terms, methodologies, and more is needed if we're to be able to use the multiple data sets over time together.

There are some additional notes on data set names which may be needed. Some data set names may include "dwc" in the name, such as after "deeryard", but that is to allow conceptual relationship to later "dwc" data, and is not meant to imply the dwc definition was applied when the areas or geospatial polygons were delineated for that specific data set. The DWC term and concept applied to delimitated areas applies in practice to data sets 2000 and after; readers need to be aware that level of application of the DWC concept could also vary, depending on information resources and input data possible on the various dates or regions. Therefore, this makes developing more complete documentation and data set details very important to a complete understanding of the derived data.

This document will assist understanding either the individual data sets, such as when grouped as subfolders of "WLD_deer_wintering_complexes_dwc_legacy_data" folder name -or- when data sets are combined in one layer yet features clearly identified by data set name same as the name listed later in this document. Value added attribute fields, meaning those with purposeful content (not where say field name "ID" contains only "0" or only "1", for example) will be renamed for the year + peninsula of data set, and moved into a single combined data layer. This document also notes supporting or related data sets which will not be possible to combine into a signal data layer, but are mentioned to help support understanding historical / legacy DWC work and because those resources could support DWC efforts.

Brief Description of Data Development and Products Over Time, Hardcopy Maps to Digital GIS Data:

The DNR has mapped deeryards, deer wintering areas, deer wintering complexes (DWC) at various intervals since 1927 to the current date.

- In the past, conventional identification and mapping were done on hardcopy maps like the DNR county map series where counties were one large 11x17 inch or tabloid page, or a larger county split across such sized pages; past earliest maps appear to be hand-copied and perhaps done with highlighter over top of map base (for examples, see the partial set of 1977-1978 map pictures, or other hardcopy earlier maps). Later the hardcopy maps were sent in to be reproduced by DNR Print and Graphic Services, and bound sets created for field offices.

- Several of these deer wintering location mapping efforts have been gathered and then digitized into GIS layers although none of the layers have had past complete metadata to define the process for the mapping effort, staff involved with the efforts have shared documents and methodology of the efforts, before those staff retired (notes of Alex Weinhagen and Marshall Strong, both DNR-Wildlife Division, Lansing Capital Complex Wildlife Division office).

- Later or newer efforts were done using GIS data or using hardcopy methods directly with GIS data creation.

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**Explanation of Deer Wintering Complex Terminology paired with Map of
Deer Wintering Areas**

A one page, double sided information handout was used repeatedly over the years as supplementary information for lands planning discussions or documents, as handout for deer management open-house meetings, and more. The handout was particularly valuable for one-side which clearly explained the DWC terminology, using a WLD reviewed, vetted and approved explanation intended for general readers interested in understanding deer wintering areas information.

Below is an image of the one-page map side which was paired with the one-page information "Notes for the Representation of Deer Wintering Complexes (DWC)" (however, due to 1 inch margins, it doesn't fit on one page when inserted in this document) which follows the map, below.
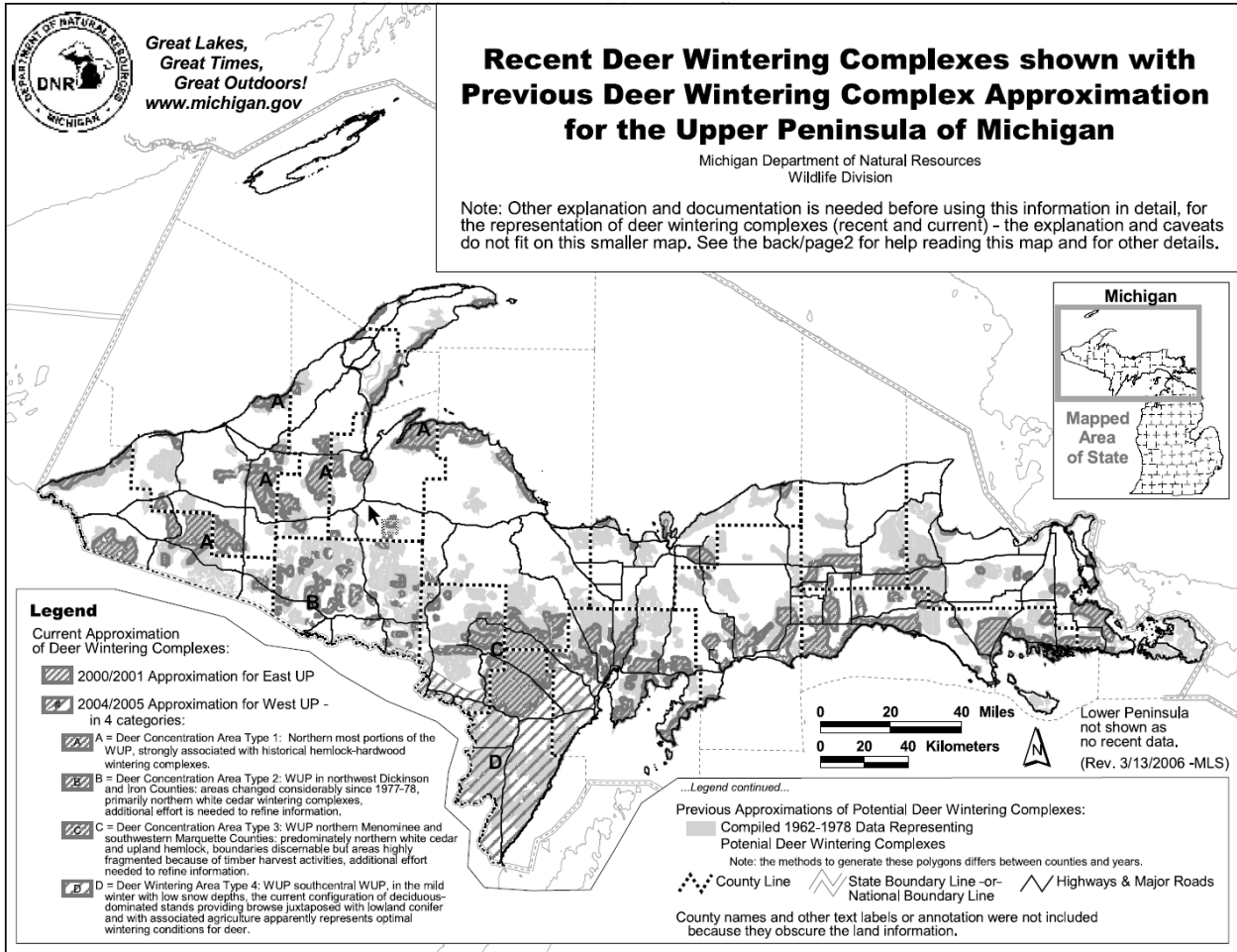

Figure 1: picture of the map size paired with the reviewed, vetted and approved DWC explanation which follows (below).

Note for the Representation of Deer Wintering Complexes

This text provides clarifying information about Deer Wintering Complexes, helps map readers, and explains some caveat, scalar and methods details.

Efforts have been made to ensure the most recent and best information layers have been used in creation of this map; however, there are some comments readers should note:

A deer wintering complex is a complicated term which requires some explanation to ensure it is clearly understood. Deer wintering complexes have sometimes been called "deer yards," but the differences in accepted definitions of "*deer yard*" mean this term is not ideal for description.   A "*deer concentration area*" is a localized site or area where deer are found during any individual winter. In contrast, a "*deer wintering complex*" is the landscape mosaic of food and cover resources used by deer in the winter.   Therefore a deer wintering complex is a local area where climate, forest cover, past deer patterns and other behavioral and ecological conditions interact which result in an area important to deer survivorship during typical winters.

- **Winter Climate**: In northern climates that receive abundant snowfall and long periods of sub-freezing temperatures, deer vacate their summer range and concentrate in ecologically distinct wintering complexes. The amount of food and shelter present on the landscape, along with prevailing snow depth, determine the capability of the deer wintering complex to support deer during the winter.

- **Forest Cover**: Conifer tree cover is important in determining the location of winter complexes, particularly in the higher snowfall areas. Conifer cover provides deer with shelter from snow, wind, and cold temperatures. In addition, conifer branches intercept and retain snow, allowing deer easier travel. In the Upper Peninsula, it appears that preferred winter cover is upland stands of eastern hemlock and swamps of northern white cedar, of appropriate age and stocking rates. Deciduous trees and shrubs adjoining conifer cover provide food for deer. Logging operations in close proximity to conifer cover provide deer with temporary abundant browse that would ordinarily be out of reach, but also may be a source for disturbance on local deer populations.

- **Past Patterns and Behavioral Conditions**: Fawns learn wintering locations from their mother or matrilineal family members and develop long-lasting affinities for specific wintering complexes. Following the onset of winter conditions, deer may migrate many miles from summer range to reach specific or preferred wintering complexes. Following winter break-up, deer disperse back to their summer areas.

- **Ecological Conditions**: The capability of wintering complexes to support deer depends on the quantity, quality, and spatial arrangement of shelter and food resources over time.   The optimal habitat mix of cover and food, at the landscape scale, appears to be approximately 50% conifer cover and 50% deciduous food, where upland conifer cover is utilized. Northern white cedar stands have the capability of providing both thermal cover and preferred winter food. Deer utilization of wintering complexes can be dynamic depending upon the onset, severity and duration of winter weather.

During 2000-2005, projects were initiated to identify the landscape-scale concentration sites of deer during the winter period in the Upper Peninsula (UP) of Michigan. This recent effort represents the first formal landscape-scale mapping effort of winter deer concentration areas and associated deer wintering complexes since DNR "deer yard" maps were produced in 1977-78. The scales and methods used to create the earlier individual winter "deer yard" maps appear to have varied across the state; previous products may not have identified deer wintering complexes by the same criteria, and are thus considered approximate representations of potential deer wintering complexes. The various years (1962 to present) do have differences in how areas were identified and scales of

reference information (i.e. scale of aerial photography, flyover height, site visits, etc.). There are differences in the 2000/2001 East UP and 2004/2005 West UP projects. Methods and scales of data development have improved over time; in the map legend, the West UP areas have a briefly described conditional index which is described in more detail in a developing document. Avoid a strict direct comparison between the previous approximations and current approximation – the information is durable on regional to county scales, but not durable at fine-scale comparisons.

Therefore when reading the map, please consider the representation to indicate the appropriately shaded area has noted importance to wintering deer, but that there are complex interacting factors which determine, on an annual basis, how important each area is and the type of usage by local deer populations.

<div align="right">(2006 Feb. 13 – MLS/RC)</div>

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Data Set Listing
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"Data set name" identifier is used for multiple purposes: Note that the "Data Set Name" in upper-left of each data set block of information, is both the same name used for data set, layer name, and in the combined single layer it's the identifier in the attribute field named "data_set_name".

Explanation of format of listing individual Data sets or discrete data layers re: deer wintering:
This document attempts to at least start to define some of the known information on each layer, with notes per data set (listed below). Each data set listed below in chronological order of data set applicable year (not year data was made GIS polygons) and follows the following sample format of information:

> **Data_set_name:**
> Descriptive text explaining known information about the data set, dates of processing or digitization, etc. and date completed as GIS data, or other details not specific to bullets, below.
> - Source:
> - Data spans the counties of:
>   Not included are counties of:
> - Data quality / detail:
> - Comments:
> - Data fields: for ??? features / polygons:
>   - Named field: description, values, etc. …
>   Any other notes …
>   Most entries are followed by a data-view map figure of that specific set.

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Data sets listed chronologically by data set name:

Includes: data-set-name	*type/format*
- **DNR_1928_up_deeryardcores_dwc**	(polygons)
- **DNR_1936_all-michigan_dwc**	(map; not GIS data)
- **DNR_1937_up_deeryard_dwc**	(polygons)
- **DNR_1947to1948_up_deeryard_county_maps_partialset**	(maps; no GIS data)
- **DNR_1950's_deeryard_dwc**	(polygons)
- **DNR_1951_all-michigan_deer_problem_areas**	(information only)
- **DNR_1962_up_deeryard_dwc**	(polygons)
- **DNR_1967_up_deeryard_dwc**	(polygons)
- **DNR_1977to1978_up_deeryards_winteringareas_dwc**	(polygons)
- **DNR_1978_nlp_deeryard_winteringareas_maps_partial_set_sourceimages**	
	(information only)
- **DNR_1978_slp_deeryarding_dwc**	(polygons)
- **DNR_1999-08-18to09-09_up_deeryardhabitat_stats_-_up_yard_owner** (information only)	
- **DNR_2000_wup_dwc_draft_v2000nov**	(information only)
- **DNR_2000_eup_deerareas_dwc**	(polygons)
- **DNR_2003_wup_deerareas_dwc_draft_v2003nov_polygons** (polygons)	
- **DWC_2005_up_dwc_final2000-2005mix**	(information only)
- **DNR 2007 and/through**	
DNR_2012_deer_wintering_complex_explained_final_vetted_text	
plus 2001 version (no DWC content changes though) (information only)	
- **DWC_2013_up_dwc_2layers_conditional** *is/was really 2 layers:*	
- **DNR_2013_up_dwc_data**	(polygons)
- **DNR_2013_up_conditional_dwc**	(polygons)
- **DNR_2016_up_dwr**	(information only)
- **DNR_2016_up_dwr_model**	(information only)

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DNR_1928_up_deeryardcores_dwc (polygons):

This upper peninsula (UP) data set is the earliest of the historical spatial data. The name is really a misnomer as it represents a rough representation of the department report descriptions of "core" yards mapped between 1927 to the early 1930's. Map to digital data done circa 2013 then qaqc check completed 2016 April 28 to 2016 May 25 and 2017 Dec. 08.

- Source: The reports at the time and staff memory mention sketch maps but they could not be located, during several attempts by field staff over more than a decade. Staff said the polygons represented known core and repeat use locations, repeat meaning used by generations of deer over time, and seen in imagery plus staff observations at sites. Staff admit the extents are very conservative which means less areas across the landscape were identified than maybe should

have been noted. Digitized from a UP scale map figure, so minimum map feature is much larger or coarse, and few in number.

- Data spans the counties of: Houghton, Ontonagon, Gogebic, Baraga, Iron, Marquette, Alger, Schoolcraft, Luce, and Chippewa. Not included are counties of: Keweenaw, Dickinson, Menominee, Delta, Mackinac, and the entire lower peninsula (LP). … plus assumed except Keweenaw county, Isle Royale (Federal land) as most delineations do not include Isle Royale.
- Data quality / detail: very low, coarse or at larger scale.
- Comments: To improve data quality, the original sketch maps as reasonable original or photocopy would be needed to improve polygons. Note the polygons are also coarse and limited in number, but they do correlate or co-place with other data, and they do show attempts to identify core deer wintering features on the landscape early in 1900's. It's been notes that the southern UP known deer wintering areas are not represented at all, which is believed odd.
- Data fields: for 12 features / polygons.
    - Field named "FID" (a default field in shapefiles): unique object Id for the 12 polygons.
    - Field named "Shape" (a default field in shapefiles): polygon.
    - Field named "ID" (a default field in shapefiles): all are zero or not set, use FID.
    - Field named "DWC" is text name of the area
    - Field named "Years" is text of years area identified, of 1928, 1929, or 1930.
- Additional Notes: (none at this time, date of document).
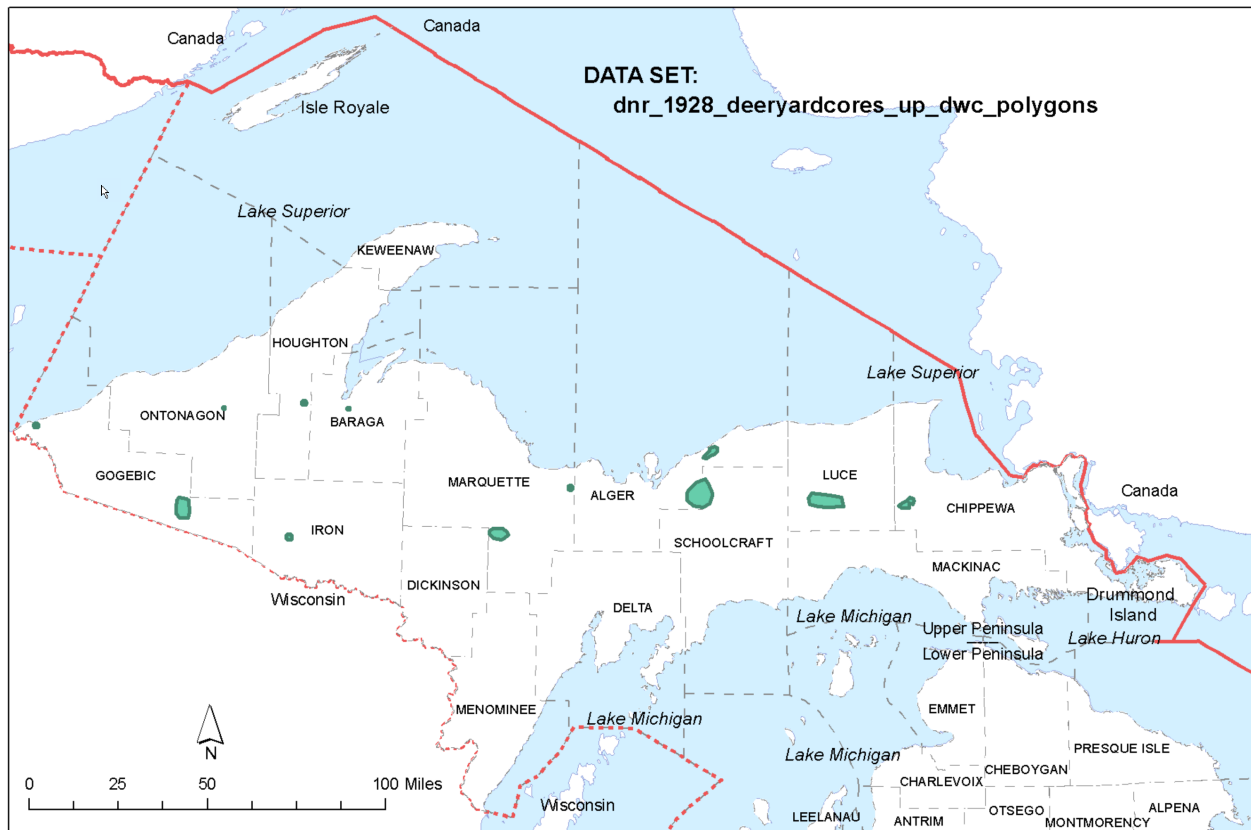
Figure 2: map figure of 1928 data set described above.

DNR_1936_all-michigan_dwc (map):

Currently this data set information is just the document map figure "dnr_1936_all-michigan_from_publication_image_DWC_1936.jpg" which is rather small scale and not yet prioritized for conversion to GIS polygons. Is listed as possible future task for WLD GIS staff. Best version of map figure found 2013 Feb. 06.

Figure 3: map image of 1936 data set described above, as used in a historical publication (add citation).

DNR_1937_up_deeryard_dwc (polygons):

These polygons represent a map of the UP deeryards from 1936-1937. They appear to map the shelter as opposed to the DWC concept. Map to digital data done circa 2013 then qaqc check completed 2016 April 28 to 2016 May 25 and 2017 Dec. 08.

- Source: Digitized from a large UP scale map so minimum map feature is moderate size or medium-to-coarse.
- Data spans the counties of: Keweenaw, Houghton, Baraga, Ontonagon, Gogebic, Iron, Marquette, Dickinson, Menominee, Alger, Delta, Schoolcraft, Luce, Chippewa, and Mackinac. Not included are counties of: entire lower peninsula.
- Data quality / detail: low to medium, even though best efforts were done to capture details, coarse or at larger scale.

- Comments: the minimum map feature size is much smaller than earlier maps.
- Data fields: 95 features / polygons.
  - Field named "FID" (a default field in shapefiles): unique object Id for the 95 polygons.
  - Field named "Shape" (a default field in shapefiles): polygon.
  - Field named "ID" (a default field in shapefiles): all are "1", identifying as area on map.
- Additional Notes: (none at this time, date of document).
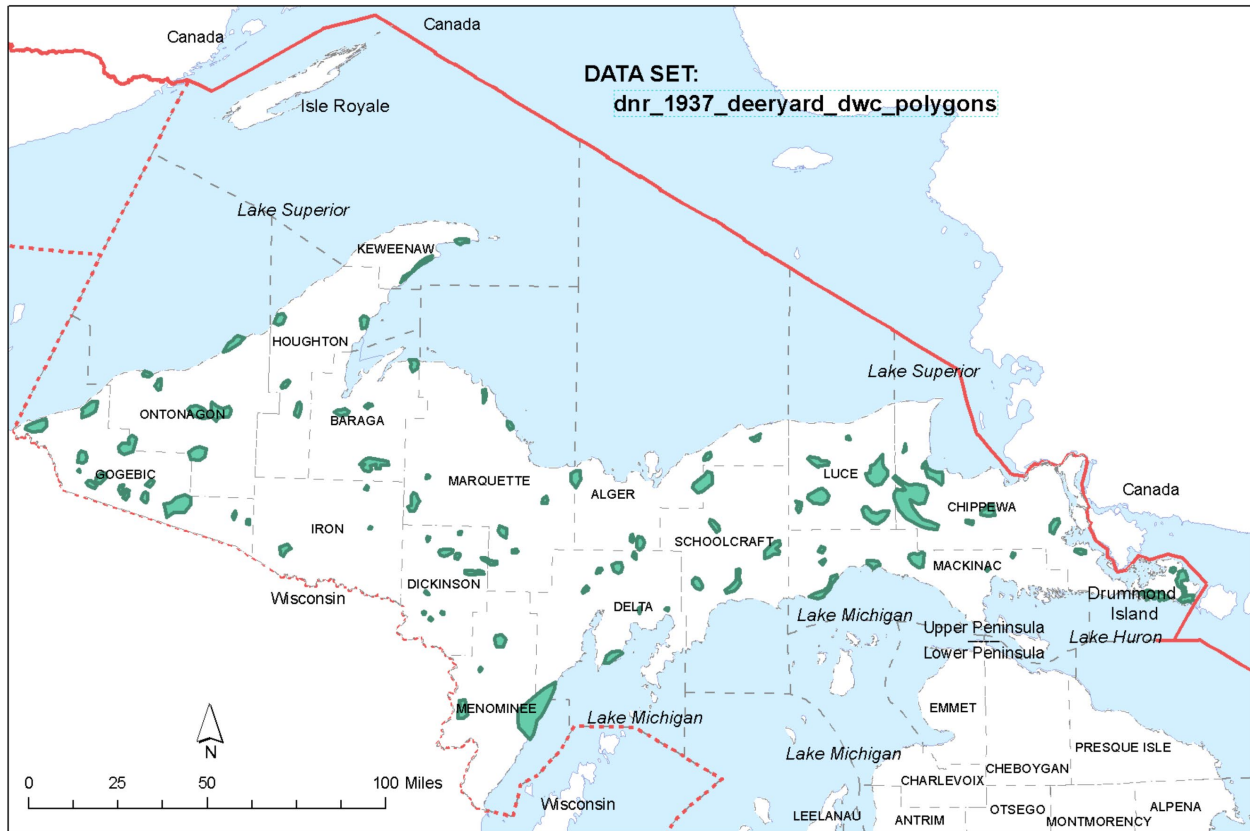
Figure 4: map figure of 1937 data set described above.

DNR_1947to1948_up_deeryard_county_maps_partialset (information only):

At the current date of these notes, this set is still an incomplete set of hardcopy maps, a partial set of county maps of mixed quality, which includes Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, and Schoolcraft counties. However, the better 1950s set (below) was processed to GIS polygons because of better quality and consistency of delineated features. It was said by legacy experienced staff that perhaps the 1947-1948 set is a first work product of local staff using accomplishment directions, which were repeated later in 1950-1951 (or early 1952 was described; hence referred to as the 1950's set). Last best list of partial set of maps is 2002 Oct. 23.

DNR_1950s_deeryard_dwc_polygons (polygons):

Digitized from 1950 era county deeryard maps. Data quality appears good. See notes above under 1947 to 1948 (above). The better 1950s set was processed to GIS polygons because of better quality and consistency of delineated features, as compared to the 1947 to 1948 set. It was said that perhaps the 1947-1948 set is a first work product of local staff using accomplishment directions which were repeated later in 1950-1951 (or early 1952 was said). Map to digital data done circa 2013 then qaqc check completed 2016 April 28 to 2016 May 25 and 2017 Dec. 08.

Upper peninsula (UP) data: for all 15 counties …

- o There are maps for 1950 delineations for the UP counties of Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft.
- o Additionally there are maps for 1951 delineations for the UP counties of Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft.
- o The two different version appear from the same delineation effort.

Lower peninsula (LP) data: found 31 counties of total 68 LP counties …

- o Maps located as poor copies, were 31 counties (predominantly in northern LP)of: Alcona, Alpena, Antrim, Arenac, Benzie, Charlevoix, Cheboygan, Clare, Crawford, Emmet, Gladwin, Grand Traverse, Iosco, Kalkaska, Lake, Leelanau, Manistee, Mason, Mecosta, Missaukee, Montmorency, Muskegon, Newaygo, Oceana, Ogemaw, Osceola, Oscoda, Otsego, Presque Isle, Roscommon, Wexford.
- o Missing or undelimited counties total 37 counties: Isabella, Midland, Bay, Montcalm, Gratiot, Saginaw, Tuscola, Huron, Sanilac, Ottawa, Kent, Ionia, Clinton, Shiawassee, Genesee, Lapeer, St. Clair, Allegan, Barry, Eaton, Ingham, Livingston, Oakland, Macomb,, Van Buren, Kalamazoo, Calhoun, Jackson, Washtenaw, Wayne, Berrien, Cass, St. Joseph, Branch, Hillsdale, Lenawee, Monroe.
- o The LP county maps are obviously problematic, poor quality and at this time of document date, they do not provide a reasonable source for digitization of the hardcopy map deer information to digital GIS polygons.

- Source: DNR county map series with hand-drawn delineated data polygons.
- Data spans the counties of: (the upper peninsula) Keweenaw, Houghton, Baraga, Ontonagon, Gogebic, Iron, Marquette, Dickinson, Menominee, Alger, Delta, Schoolcraft, Luce, Chippewa, and Mackinac. Not included are counties of: entire lower peninsula. … plus assumed except Keweenaw county, Isle Royale (Federal land) as most delineations do not include Isle Royale.
- Data quality / detail: medium to good
- Comments: the minimum map feature size is much smaller than any of the earlier maps.
- Data fields: 336 features / polygons.
  - o Field named "FID" (a default field in shapefiles): unique object Id for the 336 polygons.
  - o Field named "Shape" (a default field in shapefiles): polygon.
  - o Field named "ID" (a default field in shapefiles): all are "0", use FID for unique.
  - o Field named "Quality" is text identifying color (tan, red, or blue) of polygon which indicates food condition:
    - ▪ "Tan" = "good food condition"
    - ▪ "Red" = "poor food condition"
    - ▪ "Blue" = "medium food condition"

- o Field named "FOD_CNDTN" means food condition, text description matching color as listed above.
- o Field named "Z950s" or 1950s data = "yes" for all, representing polygon in set.
- Additional Notes: (none at this time, date of document).
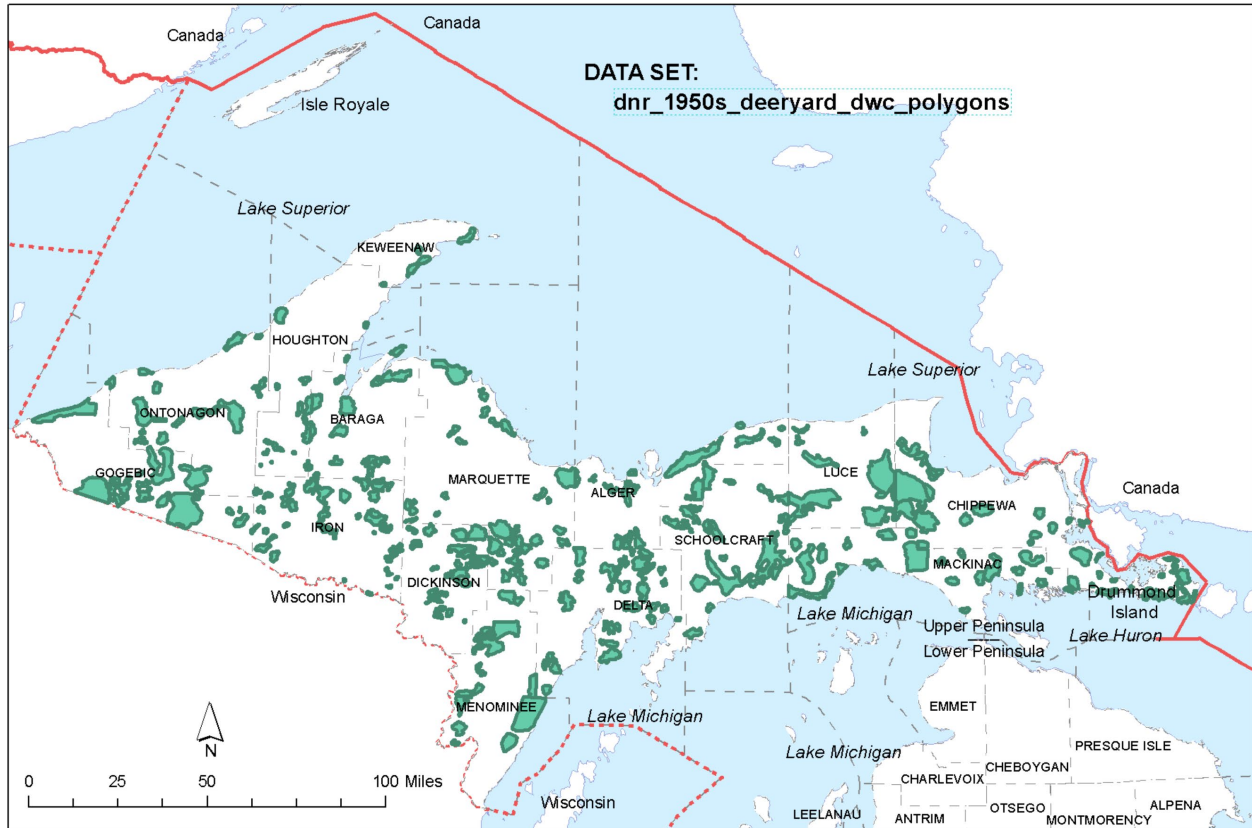
Figure 5: map figure of 1950s data set described above.

DNR_1951_all-michigan_deer_problem_areas (information only):

Data does include some descriptive deer wintering information, but this large map was done for more than just deer wintering locations, and the polygons are rather large. It's been determined that the minimum map scale is so very coarse that it's expected incompatible with smaller scale or minimum map unit developed DWC data, so will not be included with smaller scale data. This data set is still described here in case user awareness of this data set causes interests or questions on what is included in this data set. Map to digital data done 2001 March 15 and 2001 March 22, then qaqc checks ongoing until done 2001 April 02 to 2001 April 11, and map recreated after that (if notice a date 2019 Jan. 24, that was server data move date).

- Source: a large state-wide map approx. 2+ feet by 3+ feet, and includes a key to 16 specific areas on the map, with a lot of descriptive text provided on source map and reproduced for data layer plus listed below. … assumed map information excludes or except Keweenaw county, Isle Royale (Federal land) as most delineations do not include Isle Royale.

- Data spans the counties of: all Michigan (plus assumed exclude Keweenaw county, Isle Royale (Federal land) as most delineations do not include Isle Royale), even if data polygons not include all counties). Not included are counties of: just Isle Royale in northern Keweenaw county.
- Data quality / detail: moderate to good, as polygons on map had small detail boundaries and these were able to be reproduced in the data layer.
- Comments: Detail and vetted methods were used to do best-of generation of map data.
- Data fields: 16 features / polygons.
  - Field named "FID" (a default field in shapefiles): unique object Id for the 16 polygons.
  - Field named "Shape" (a default field in shapefiles): polygon.
  - Field named "ID" (a default field in shapefiles): all are "0" to "16", identifying as area on map and legend but better field for matching descriptive legend is next field "Area_ID".
  - Field named "Area_ID" is field matching the 16 descriptive text blocks listed above (in source information), of "1" to "6", "A", "b", "C", "D", "E1" + "E2" + "E3" + "E4" (for the multiple polygons under "E"), "F" and "G".
- Additional notes: *** Note that the conversion to GIS data resulted in four shapefiles, completed with double-checks by student position and professional; specific layer shapefile names are listed below with matching detail from the descriptive text legend blocks.

  The following legend used for area on map:

  - (In northeastern lower peninsula, larger outlined area:) "Recommended special hunting boundaries". Note that this was made a separate shapefile
        ("dnr_1951_deerproblemareasmap_polys_recommended.shp ").
  - (In northeastern lower peninsula, smaller outlined area:) "Minimum special hunting boundaries". Note that this was made a separate shapefile
        ("dnr_1951_deerproblemareasmap_polys_minimum.shp ").
  - (In northwestern shoreline counties and lower half of lower peninsula:) "Area authorized for deer herd management". … 1949 (according to map).
        Note that this was made a separate shapefile
        ("dnr_1951_deerproblemareasmap_polys_managementareas.shp ").

  The rest of these areas in legend are in another separate shapefile, and some of these areas relate to deer wintering details
        ("dnr_1951_deerproblemareasmap_polys_deer_problem_see_key.shp ")
  - (In northern/northeastern Houghton county:) Area No.1 = "Heavy intermittent damage to strawberry farms. 60 Square miles. Present kill estimated 2 bucks per square miles. An additional kill of 2 deer per square mile would tend to relieve damage."
  - (In most of Houghton county, western Baraga county, eastern and central Ontonagon county, and eastern Gogebic county:) Area No. 2 = "2,600 square miles in which the majority of the deeryarding area is over-browsed—some of it for 15 years. Present kill estimated at between 2 and 3 bucks per square mile. An additional kill of 2 or 3 deer per square mile would reduce the excessive pressure on winter food."
  - (In southwestern Marquette county and northern Dickinson county:) Area No. 3 = "Winter food shortage on 765 square miles. Starvation found over much of this area as early as 1936. Present buck kill about 2 per square mile. An equal additional kill would materially aid the situation."
  - (In southern Delta county:) Area No. 4 = "Heavy, rapidly increasing deer population. Crop damage increasing in severity and over-browsing of yards imminent. Doubling of

the present kill of 3 deer per square mile would postpone and alleviate critical conditions. 100 square miles."

- o (In central Schoolcraft county:) Area No. 5 = "220 square miles in the Seney-Blaney area. Heavy starvation has occurred in this area for 10 or more years. 500 bucks (2.5 per sq. mi.) taken annually. An additional take of 3.5 deer per square mile would help the situation."
- o (In Chippewa county, Drummond Island:) Area No. 6 = "130 square mile Drummond Island has been progressively over-browsed since 1934. Starvation and its various related effects have reduced the herd considerably. 179 bucks were taken in 1951. 200 deer should be taken in addition to the regular buck kill to allow the winter food to recover."
- o (In western costal Charlevoix and Antrim counties, and northern/northeastern Grand Traverse county:) Area "A" and (same details as "B", below).
- o (In mainland Leelanau county, Benzie county (all county), western/northwestern Manistee county, northern to western Grand Traverse county:) Area "B" = "A critical orchard-damage area, special deer hunting regulations applied after the 1949 legislative authorization, controlled the deer herds in this area. Future regulations will depend on numbers of deer present, size of farm crops, and resulting damage. Further special seasons are anticipated with boundaries, numbers of permits and related regulations adjusted to existing conditions on an annual basis."
- o (In central to western Allegan county:) Area "C" = "The original Michigan special deer hunting area authorized by legislature in 1941. Special limited reasons on antlerless deer held each year since. Future recommendations to be based on existing conditions."
- o (In southern/southeastern Manistee county, southwestern Wexford county, eastern Mason county, almost all Lake county, western Osceola county, and northern Newaygo county:) Area "D" = "Intermittent winter food shortage - 1200 square miles. Special legislative authorized seasons in 1949 and 1950 in northern Newaygo County partially alleviated over-browsing in that area. The remainder of the area needs similar treatment. Normal buck kill 5 per square mile. An additional take of 2 or 3 deer per square mile would tend to relieve the excess pressure on the food."
- o (Three areas in northeastern lower peninsula, spanning parts of several counties:) Area "E" = "The major problem area covering more than 3,000 square miles. Estimated 1951 starvation loss was near 40, 000 deer. Annual buck kill now approximately 8 per square mile. An additional kill at least equal to the buck kill should be made. Boundary of special hunting area suggested in past years shown in green. Present conditions indicated additional areas to the north, west, and south should now be included."
- o (In northeastern Arenac county and southern-southeastern Iosco county:) Area "F" = "162-square-mile muck-crop damage area. Buck kill now estimated at 500. A kill of an additional 500 would relieve the damage and still leave a good breeding stock."
- o (In northwestern Emmet county, appears Wilderness area:) Area "G" = "Wilderness Park – 30 square miles. Heavy over-browsing on available desirable winter food. Annual buck kill estimated at 100. The taking of an additional 50 deer would tend to relieve undesirable conditions."

- Map reproduced using GIS data, follows as inserted graphic in this file: …

Figure 6: map figure of 1951 data set described above, but on it's own page (next) so maximum size.

Deer Problem Areas, 1951
(Reproduction of a 1951 Hardcopy Map)

State of Michigan

Michigan DNR
Department of Natural Resources
Wildlife Bureau

Note: This map is a reproduction of a 1951 DNR map resource, derived off a copied hardcopy map. Digital data was generated from the hardcopy map, by approximating boundary lines using proximity to county lines, roadways, and waterways depicted on the original hardcopy map. No source digital data were available; every best effort was made to create as accurate and complete a map as possible with current technologies and resources, but some unassessed error is inherent based on available and applied methods used to re-create the 1951 map.

This map is for use as a general resource, and not for cadastral or legal purposes.

Recommended Special Hunting Boundaries

Minimum Special Hunting Boundaries

Area Authorized for Deer Herd Management

Comments on Deer Problem Areas:

Area "1" -
60 square miles - in southern portion of part of Houghton County in Keweenaw Peninsula. Heavy intermittent damage to strawberry farms. Present kill estimated 2 bucks per square miles. An additional kill of 2 deer per square mile would tend to relieve damage.

Area "2" -
2,600 square miles - western upper peninsula, in which the majority of the deeryarding area is over-browsed - some of it for 15 years. Present kill estimated at between 2 and 3 bucks per square mile. An additional kill of 2 or 3 deer per square mile would reduce the excessive pressure on winter food.

Area "3" -
765 square miles - in Marquette and Dickinson Counties. Winter food shortage on this area. Starvation found over much of this area as early as 1936. Present buck kill about 2 per square mile. An equal additional kill would materially aid the situation.

Area "4" -
100 square miles - in southcentral Delta County. Heavy, rapidly increasing deer population. Crop damage increasing in severity and overbrowsing of yards imminent. Doubling of the present kill of 3 deer per square mile would postpone and alleviate critical conditions.

Area "5" -
220 square miles - in the Seney-Blaney area of Luce County. Heavy starvation has occurred in this area for 10 or more years. 500 bucks (2.5 per square mile) taken annually. An additional take of 3.5 deer per square mile would help the situation.

Area "6" -
130 square miles - in southeastern Chippewa County. Drummond Island has been progressively over-browsed since 1934. Starvation and its various related effects have reduced the herd considerably. 179 bucks were taken in 1951. 200 deer should be taken in addition to the regular buck kill to allow the winter food to recover.

Area "A" and "B" -
1270* square miles total - northern portion (area "A", 270* square miles) in western Charlevoix and Antrim Counties, and southern portion (area "B", 1,000* square miles) in Leelanau, Grand Traverse, Benzie, and Manistee Counties. A critical orchard-damage area; special deer hunting regulations applied after the 1949 legislative authorization, controlled the deer herds in this area. Future regulations will depend on numbers of deer present, size of farm crops, and resulting damage. Further special seasons are anticipated with boundaries, numbers of permits and related regulations adjusted to existing conditions on an annual basis.

Area "C" -
60* square miles - in western Allegan County. The original Michigan special deer hunting area authorized by legislature in 1941. Special limited seasons on antlerless deer held each year since. Future recommendations to be based on existing conditions.

Area "D" -
1200 square miles - in Lake County and surrounding counties. Intermittent winter food shortage. Special legislative authorized seasons in 1949 and 1950 in northern Newaygo County partially alleviated overbrowsing in that area. The remainder of the area needs similar treatment. Normal buck kill 5 per square mile. An additional take of 2 or 3 deer per square mile would tend to relieve the excess pressure on the food.

Area "E" -
3,500* square miles - in northeastern lower peninsula. The major problem area covering more than 3,000 square miles. Estimated 1951 starvation loss was near 40,000 deer. Annual buck kill now approximately 8 per square mile. An additional kill at least equal to the buck kill should be made. Boundary of special hunting area suggested in past years shown in green (line). Present conditions indicated additional areas to the north, west, and south should now be included (recommended area shown in red boundary line).

Area "F" -
162 square miles - in Iosco and Arenac Counties. Muck-crop damage area. Buck kill now estimated at 500. A kill of an additional 500 would relieve the damage and still leave a good breeding stock.

Area "G" -
30 square miles - in northwestern Emmet County. Wilderness Park area. Heavy overbrowsing on available desirable winter food. Annual buck kill estimated at 100. The taking of an additional 50 deer would tend to relieve undesirable conditions.

* Indicates the area square miles were not provided in original map, area therefore calculated and rounded to match generalized figures in original map. Text blocks were also standardized with sq.mi. listed first.

Approximate total deer problem areas in 1951 is 10,100* square miles, or approximately 17* percent of Michigan.

The minimum special hunting boundary includes approximately 3,500* square miles (or 6* percent of State), and the recommended special hunting boundary includes 5,775* square miles (or 10* percent of State) or a 65* percent increase over the minimum special hunt boundary area.

Legend
- Special Hunting Boundaries (Minimum)
- Special Hunting Boundaries (Recommended)
- Deer Problem Areas
- Authorized Deer Herd Management Area in 1949
  (West and east of dividing line, the State Legislature in 1949 authorized deer herd management)
- Highways and Major Roads
- County Boundary Line

N

Scale 1:1,250,000

0 10 20 30 40 50 60 70 80 90 100 Miles

0 10 20 30 40 50 60 70 80 90 100 Kilometers

Map produced with the following data sources:
A hardcopy of 1951 Deer Problem Areas map
(provided by and later returned to G.Matthews, Wildlife Bureau, DNR, Michigan)
USGS DLG and MIRIS 1:24,000 county boundary
(DNR-WLB GIS MDB: strc024).

Map produced on date: 30 March 2001.
Map prepared by: Y.U, Wildlife Bureau, DNR, Michigan,
with statistical additions made by M.Strong, Wildlife Bureau, DNR, Michigan.
Map prepared for request of: G.Matthews, NELP, Wildlife Bureau, DNR, Michigan, and
with interest by multiple officers/staff, Wildlife Bureau, DNR, Michigan.
(DNR-WLB-GIS/SAL draft map tracking number: 2001-03-30-001)

Michigan

Mapped area is all of State

DNR_1962_up_deeryard_dwc (polygons):

Data digitized from county map mapping efforts started in 1961 and done in 1962. Map to digital data started 2001 Jan. 11, done circa 2003 June 10 then qaqc check completed 2016 April 28 to 2016 May 25 and 2017 Dec. 08 (believed to be a map projection check).

- Source: DNR county map series with hand-drawn delineated data polygons.
- Data spans the counties of: all upper peninsula, except Keweenaw county, Isle Royale (Federal land). Not included are counties of: all lower peninsula.
- Data quality / detail: good.
- Comments: see notes below.
- Data fields: 312 features / polygons.
    - Field named "FID" (a default field in shapefiles): unique object Id for the 312 polygons.
    - Field named "Shape" (a default field in shapefiles): polygon.
    - Field named "ID" (a default field in shapefiles): all are "0", identifying as area on map and legend but better field for matching descriptive legend is next field "Area_ID".
    - Field named "food_condi" for food condition, a single digit number designated by a 1, 2 or 3.
    - Field named "food_con_1" for text food conditional description short string, of "good", "medium" or "poor" and which corresponds to the numerical field above (1, 2 or 3).
- Additional notes relevant to this data set development are between dashed lines, below:

    ----
    readme file for: up_deeryard_1962 shapefile
    originally located in: g:/gis/gim/weinh/species/deer/yard_id/
    Alex W. 10/31/2000

    AV shapefile of Upper Peninsula deer yards circa 1962 in MI Georef; created 10/2000 via on-screen digitizing using hard copy maps provided by Steve Chadwick. Requested by John Urbain and Steve Chadwick for first step in larger deer yard identification project (to include field personnel and on-the-ground work).

    Attributes:
    food_condition1   food condition within yard; values: 1,2,3;
    where 1=good, 2=medium, 3=poor
    food_condition2   same as above but with text values instead of numeric

    Source:

    Note: 01/11/2001 - The original maps depicting these 1962 deer yards WERE found later (hidden away, discovered after move to Mason bldg.), as of 1/11/2001, NO additional QA/QC has been done to this dataset using the original maps. Alex will try to do this prior to his departure, but no guarantees... Alex will update this readme file if he follows up on this... original maps have a green paper cover and are in Alex's map cases.

    Created from hard copy Dept. of Conservation county maps (28 total; some counties covered by more than one map) on which deer yards had been shaded. Maps used were NOT originals as these could not be located. Maps used were obviously photo copies of the originals which presented a number of problems with interpretation. Yards likely not hand drawn, but unclear how overlay was done. No information is available on how these maps were created, who created them, how many people were involved, accuracy, etc...

    Processing Steps:
    On-screen digitizing in Arcview using the hardcopy maps and various digital base data also present on the maps as references. Digital data used to place linework included: section

lines (g:/gis/polit/trs24), county lines (g:/gis/polit/stco24), 100k DLG major roads (g:/gis/trans/rd100maj_up), 100k DLG minor roads (g:/gis/trans/rd100min_up), county DRG images (g:/gis/image/drg/).

Various scales used on-screen to do digitizing - linework created to approximate lines on maps - not to duplicate them exactly. On-screen digitizing done by Yali Li, with follow-up QA/QC by Alex Weinhagen.

Caveats/Concerns:
Deer yard polygons drawn on top of DOC maps had "holes" for major lakes, HOWEVER, the placement of these holes did not line up exactly with what was shown on the DOC maps. Obviously the yard polygons were overlaid on the DOC maps and the overlay wasn't perfect.
Given this, the poor quality of the maps (photocopy quality), and the lack of information on how these maps were created, CAUTION should be taken when using this dataset. It is likely adequate for general map-making at the 1:100,000 scale or broader. Area estimates and other analysis using this dataset will be of limited precision and questionable accuracy.
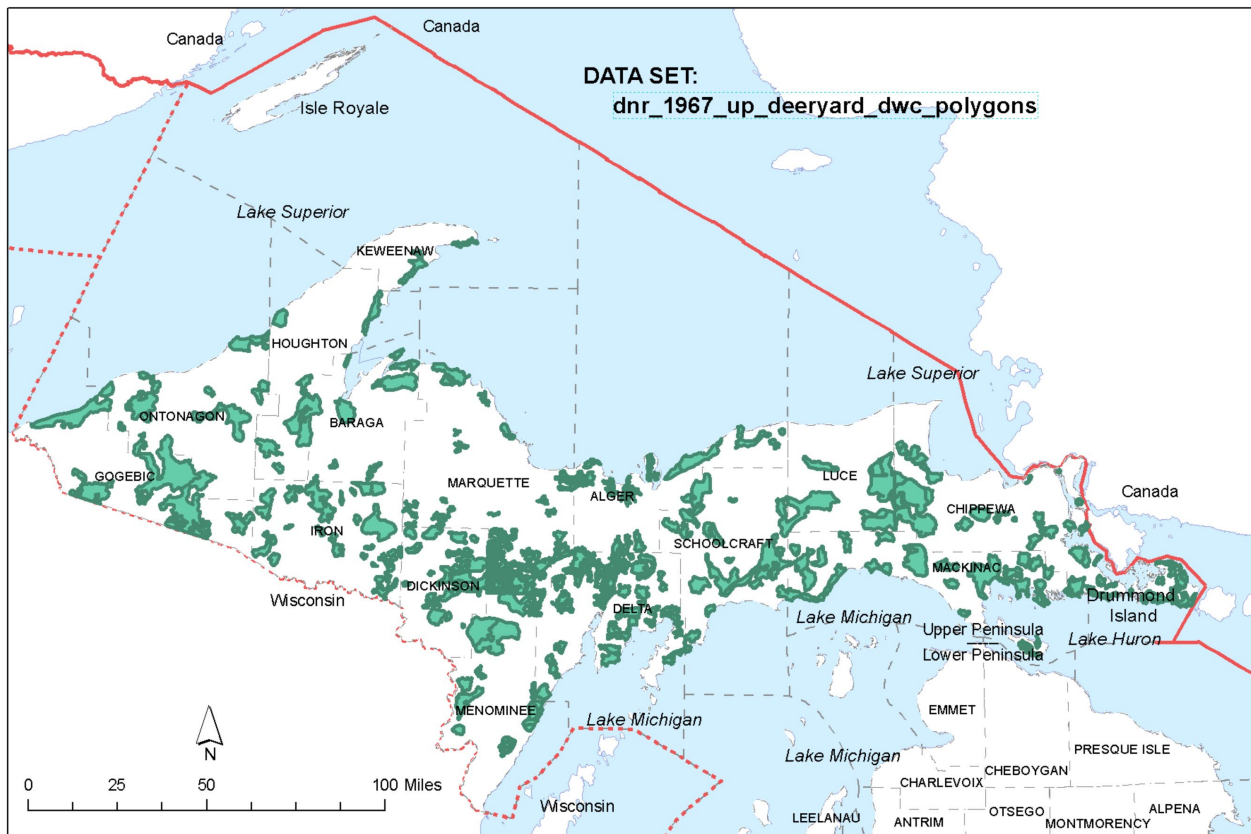

Figure 7: map figure of 1962 data set described above.

DNR_1967_up_deeryard_dwc (polygons):

Data digitized from county map mapping efforts. Not sure what the real difference between the two layers is. Map to digital data started 2001 Jan. 11, done circa 2003 June 10 then qaqc check completed 2016 April 28 to 2016 May 25 and 2017 Dec. 08 (believed to be a map projection check).

- Source: DNR county map series with hand-drawn delineated data polygons.
- Data spans the counties of: all upper peninsula, except Keweenaw county, Isle Royale (Federal land). Not included are counties of: all lower peninsula.
- Data quality / detail: good.
- Comments: see notes below.
- Data fields: 310 features / polygons.
    - Field named "FID" (a default field in shapefiles): unique object Id for the 310 polygons.
    - Field named "Shape" (a default field in shapefiles): polygon.
    - Field named "ID" (a default field in shapefiles): all are "0", identifying as area on map and legend but better field for matching descriptive legend is next field "Area_ID".
    - Field named "food_condi" for food condition, a single digit number designated by a 1, 2 or 3.
    - Field named "food_con_1" for text food conditional description short string, of "good", "medium" or "poor" and which corresponds to the numerical field above (1, 2 or 3).
- Additional notes relevant to this data development set are between dashed lines, below:

    2003-01-29 note
    similar to the 1962 deer yard maps, there is a set of 1967 deer yard maps (were actually confused with the 1962 data), and these maps are being digitized as of 2003 Jan. in Lansing by Marshall Strong and Kevin Gardiner.
    Contact Marshall Strong, Michigan DNR Wildlife Division, GIS and Mapping Specialist, email strongml@michigan.gov , for updates or completed data (will take bit to digitize).

    ----
    readme file for: up_deeryard_1967 shapefile
    originally located in: g:/gis/gim/weinh/species/deer/yard_id/
    Alex W. 01/11/2001

    AV shapefile of Upper Peninsula deer yards circa 1962 in MI Georef; created 10/2000 via on-screen digitizing using hard copy maps provided by Steve Chadwick. Requested by John Urbain and Steve Chadwick for first step in larger deer yard identification project (to include field personnel and on-the-ground work).

    Attributes:
    food_condition1   food condition within yard; values: 1,2,3;
            where 1=good, 2=medium, 3=poor
    food_condition2   same as above but with text values instead of numeric

    Source:

    Note: 01/11/2001 - The original maps depicting these 1962 deer yards WERE found later (hidden away, discovered after move to Mason bldg.), as of 1/11/2001, NO additional QA/QC has been done to this dataset using the original maps. Alex will try to do this prior to his departure, but no guarantees... Alex will update this readme file if he follows up on this... original maps have a green paper cover and are in Alex's map cases.

    Created from hard copy Dept. of Conservation county maps (28 total; some counties covered by more than one map) on which deer yards had been shaded. Maps used were

NOT originals as these could not be located. Maps used were obviously photo copies of the originals which presented a number of problems with interpretation. Yards likely not hand drawn, but unclear how overlay was done. No information is available on how these maps were created, who created them, how many people were involved, accuracy, etc...

Processing Steps:
On-screen digitizing in Arcview using the hardcopy maps and various digital base data also present on the maps as references. Digital data used to place linework included: section lines (g:/gis/polit/trs24), county lines (g:/gis/polit/stco24), 100k DLG major roads (g:/gis/trans/rd100maj_up), 100k DLG minor roads (g:/gis/trans/rd100min_up), county DRG images (g:/gis/image/drg/).

Various scales used on-screen to do digitizing - linework created to approximate lines on maps - not to duplicate them exactly. On-screen digitizing done by Yali Li, with follow-up QA/QC by Alex Weinhagen.

Caveats/Concerns:
Deer yard polygons drawn on top of DOC maps had "holes" for major lakes, HOWEVER, the placement of these holes did not line up exactly with what was shown on the DOC maps. Obviously the yard polygons were overlaid on the DOC maps and the overlay wasn't perfect. Given this, the poor quality of the maps (photocopy quality), and the lack of information on how these maps were created, CAUTION should be taken when using this dataset. It is likely adequate for general map-making at the 1:100,000 scale or broader. Area estimates and other analysis using this dataset will be of limited precision and questionable accuracy.

Figure 8: map figure of 1967 data set described above.

DNR_1977to1978_up_deeryards_winteringareas_dwc (polygons):

These data represent county based mapping effort in 1977 through to 1978. Map to digital data started 2004 may 03, done then qaqc check completed 2016 April 28, with recheck 2016 May 25 and 2017 Dec. 08 (believed to be a map projection check).

- Source: DNR county map series with hand-drawn delineated data polygons.
- Data spans the counties of: all upper peninsula, except Keweenaw county, Isle Royale (Federal land). Not included are counties of: all lower peninsula. The 1977 delineated maps of UP counties: Marquette, Mackinac, Luce, Chippewa, Delta, Gogebic, Baraga, Houghton, Keweenaw (without Isle Royale), and Ontonagon. The 1978 delineated maps of UP counties: Dickinson, South Menominee, East Iron, and West Iron (however, raises question of where is north Menominee county because we have that data.)
- Data quality / detail: good although some specialists (during review) have commented that this data may over estimate distribution in some areas, yet purpose was to map thermal cover and immediate browse, versus the earlier efforts which may have only identified thermal cover or deer wintering areas.
- Comments: see notes below.
- Data fields: 146 features / polygons.
    - Field named "FID" (a default field in shapefiles): unique object Id for the 146 polygons.
    - Field named "Shape" (a default field in shapefiles): polygon.
    - Field named "THEID" (a default field in shapefiles): unique object identifier (ID) value for the 146 polygons , matching the field "FID".
    - Field named "ID" where all are "1" single numerical digit, , and identifying as area on map and legend.
    - Field named "acres" floating number of calculated acres.
- Additional notes:

    Two alternate data sets were encountered after the above data set developed, and these were compared, found missing data, and mentioned here to explain how to know if encounter these incomplete data set derivations:

    - "dnr_1977to1978_parts_up_deeryard_1977to1978_v2004apr30_draft.shp" have questionable or incomplete attribute fields and only have data polygons in central upper peninsula as compared to those seen in the qaqc'ed/vetted layer, so recommend if encountered, do NOT USE. This data set mentioned in case somehow encountered internally in upper peninsula saved data by a user.

    - "dnr_1977to1978_up_dwc_polygons_draft _v2004may18.shp" or files dated then have questionable or incomplete attribute fields, APPEARS TO BE MISSING WESTERN Iron county data, appears to be missing data for central eastern upper peninsula (Luce, Schoolcraft and western Mackinac counties), and odd polygon splits of those seen in the qaqc'ed/vetted layer , so recommend if encountered, do NOT USE. This data set mentioned in case somehow encountered internally in upper peninsula saved data by user.
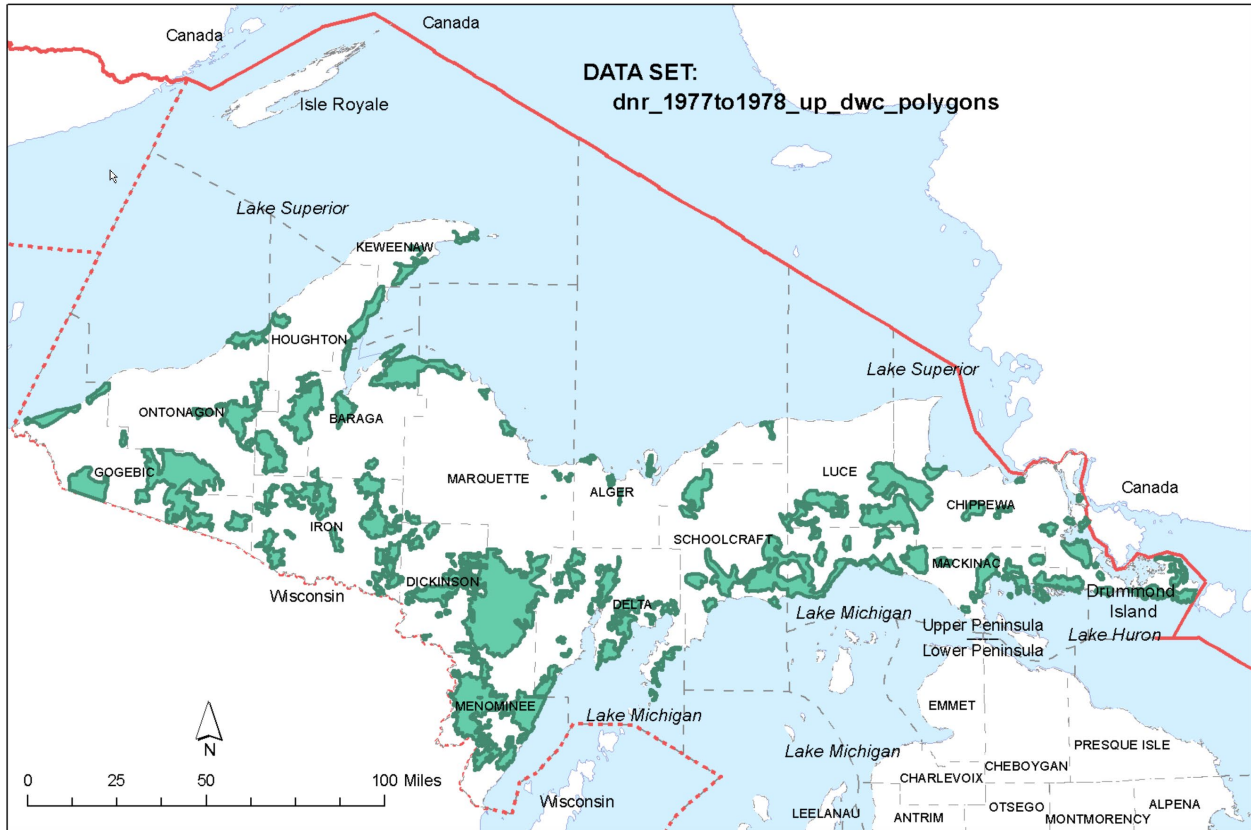
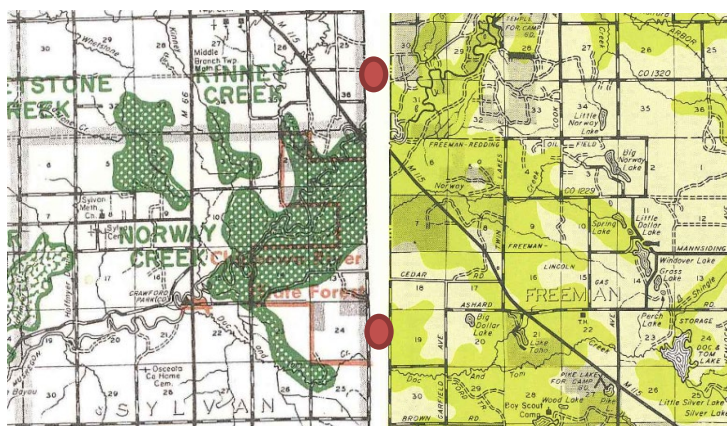Figure 9: map figure of 1977to178 data set described above

DNR_1978_nlp_deeryard_winteringareas_maps_partial_set_sourceimages (information only):

This set is not GIS data polygons, but a saved set of images of source DNR county maps of mixed quality, missing some counties. Set last compiled or gathered date is 2011 July 22, for select 32 NLP counties, yet there are wear problems, fade, clipped maps, and other problems. Legacy hardcopy maps were located for 32 maps for northern lower peninsula (NLP) of anticipated 37+ maps needed to complete the area. There are reasonable yet poorer image versions (poorer referring to the blurriness and poor edge of the two categories delineated on the maps of 27 counties of Alpena, Arenac, Benzie, Clare, Crawford, Emmet, Gladwin, Grand Traverse, Iosco, Kalkaska, Lake, Manistee, Mason, Missaukee, Montmorenecy, Newaygo, Ociana, Ogemaw, Osceola, Oscoda, Otsego, Roscommon, and Wexford. There are Poorer and clipped-image versions of 5 counties of Antrim, Charlevoix, Cheboygan, Leelanau, Presque Isle. The set is completely missing 5 counties of Alcona, Mecosta, Isabella, Midland, and Bay … and possibly offshore NLP islands.

It appears there was attempts to develop a uniform delineation of deer "winter range" and "deer yard". Problems are that differences in feature delineation by different wildlife biologists can be clearly seen along county line interrupting landscape features and habitats, where the county boundary separates different wildlife biologists. This is seen in many locations, and lead us when reviewed the maps (several DNR Wildlife Division specialists in 2004-2006 and again in 2010-2011) that different interpretations of the directions were understood and applied by different staff doing the delineations. This problem was also discussed with legacy staff and confirmed that there we problems with methodology during this northern lower peninsula data creation task.

Some of the maps which were able to be found are very poor quality and resulted in poor pictures which might be used for processing to GIS polygons. The shades of the two feature categories ("winter range" and "deer yard") are so similar as to bleed-into each other or show many areas of unclear boundaries, and it appears the boundary with non-delineated areas also blurred or fuzzy.

Maps also have some hand-written notes in pencil and ink, in margins of some of the hardcopies (so notes can be seen in some of the map pictures stored in folder named for this data set).

Note: red dots show where the polygons should be similar going over county line.

Also note the blue and fade problems in right-side image (one of the bests / clearest).

Sample of eastern Otsego Co.   Sample of western Clare Co.

Figure 10: images of sample map data along shared county line, which shows differences in delineation and mismatches across county lines where staff doing the delineation work changes.
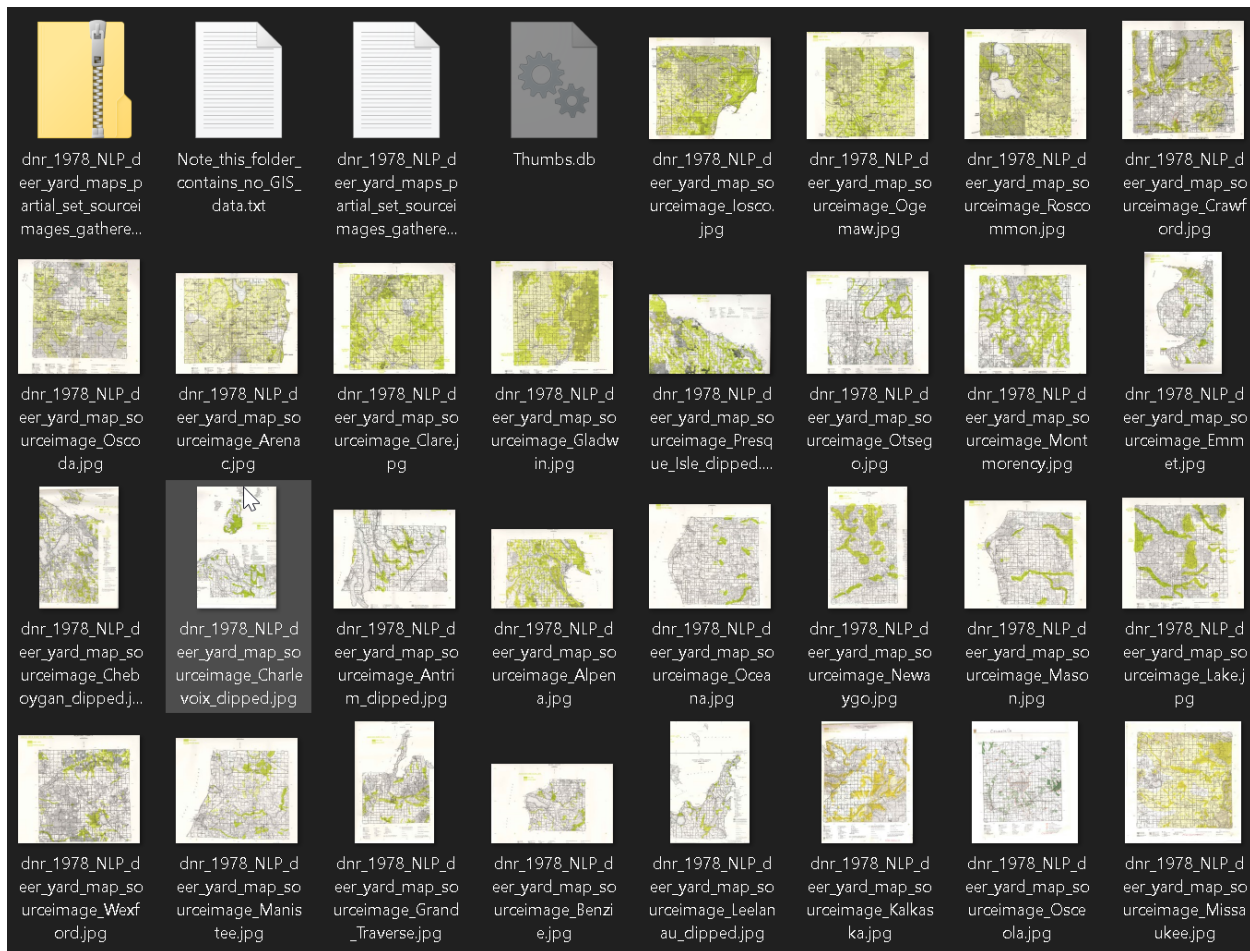
Figure 11: images of the set of map data, described above.

DNR_1978_slp_deeryarding_dwc (polygons):

These data represents county based mapping effort in 1977 through to 1978, similar to the upper peninsula set listed earlier. Map to digital data started 2001, done and qaqc check completed 2002 Aug. 02, with recheck 2016 May 25 and 2017 Dec. 08 (believed to be a map projection check).

- Source: DNR county map series with hand-drawn delineated data polygons.
- Data spans the counties of: 35 total counties in southern lower peninsula, below and including the counties of Muskegon, Kent, Montcalm, Gratiot, Saginaw, Tuscola, Huron, Sanilac, Ottawa, Ionia, Clinton, Shiawassee, Allegan, Barry, Eaton, Ingham, Livingston, Van Buren, Kalamazoo, Calhoun, Jackson, Washtenaw, Berrien, Cass, St. Joseph, Branch, Hillsdale, and Lenawee. Note that Genesse, Lapeer, St. Clair, Oakland, Macomb, Wayne and Monroe counties all were said included but have no polygons. Not included are counties of: all upper peninsula and northern lower peninsula above and including counties of Oceana, Newaygo, Mecosta, Isabella, Midland and Bay.
- Data quality / detail: good although some specialists (during review) have commented that this data not have been done exactly the same way as the UP or NLP, as there are so few areas and

total extent is unexpectedly low, so may under estimate distribution in some areas; similarly purpose was to map thermal cover and immediate browse, versus the earlier efforts which may have only identified thermal cover or deer wintering areas. However, the southern lower peninsula is known to have more widespread wintering areas and possible browse, allowing easier winter survivorship than either NLP or UP.

- Comments: if consider these core DWC locations, these should be dependable with other data.
- Data fields: 112 features / polygons.
    - Field named "FID" (a default field in shapefiles): unique object Id for the 112 polygons.
    - Field named "Shape" (a default field in shapefiles): polygon.
    - Field named "ID" (a default field in shapefiles): where all are "o" single digit number, indicating area on map for the DWC polygons.
    - Field named "survey_ID" where entries are represented as three digit numbers (of various number of digits each) separated by dashes, or for example "9-4-1" and which are not dates.
    - Field named "low_estima" (low estimated) whole integer values for number of deer estimated supported in the polygon, (values of 0, 12, 20, 50, 75, 100, 200, 300, and 500) ... and pairs with data in next field "high_estim" (high estimated). See comment with next field "high_estim".
    - Field name "high_estim" (high estimated) whole integer values for number of deer estimated supported in the polygon, (values of 0, 12, 20, 50, 75, 100, 200, 300, and 500) ... and pairs with data in next field "low_estima" (low estimated). Note the pair of values in "low_estima" and "high_estim" may be the same value for some entries.
    - Field name "comments" which include some descriptive text comments for some polygons but not all polygons, of the deer observed, of habitat, cover or browse, or other supporting comments.
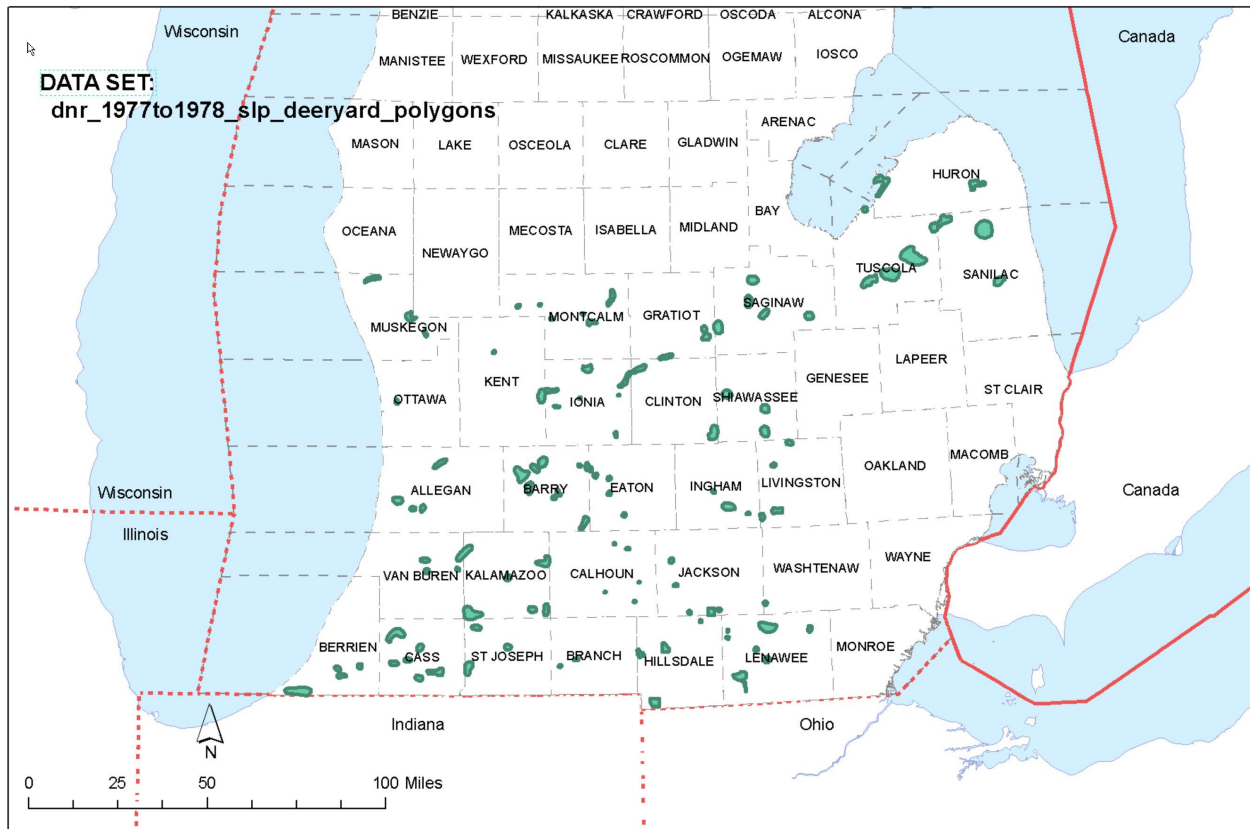- Additional Notes: (none at this time, date of document).

Figure 12: map figure of 1977to1978 SLP data set described above.

DNR_1999-08-18to09-09_up_deeryardhabitat_stats_-_up_yard_owner (information only):

Note this is a statistic set of results from classified landuse/landcover for the upper peninsula intersected with landowner. The original source LULC data is not included with the other DWC data, but the source data is on DNR centralized data server (1999 upper peninsula deer habitat).

For the summary data compilation, data processing work was done 1999 Aug. 18 through Aug. 23, with notes on process (in the data set folder) completed 1999 Sept. 09. Data work was done for DNR Wildlife Division specialists and deer management needs for planning, plus a PowerPoint presentation and several spreadsheets with multiple worksheets were made (in the data set folder) and shared with management and specialist staff.

The spreadsheet files include separate worksheets for each GRID format value of the input layer, so can be referenced if need to see differences in the subset results during processing to the final results.

Data processing used a matching current estimate of State and Federal ownership, and the non-State/non-Fed ownership which is referred to as "Private/Other" is inferred by identification and removal of the State and Federal ownerships.

"dnr_1999-08-18to09-09_up_deeryard_stats_-_up_yard_owner_-deer_winter_summary-pict.jpg"

Deer Wintering Habitat Ownership[a] for the Upper Peninsula

	Area in square miles (% of total)		
Owner	Prime Wintering Habitat[b]	Non-Pine Conifer Cover	All Conifer Cover[c]
Federal	306 (23.0)	340 (23.2)	566 (24.5)
State	431 (32.4)	467 (31.9)	803 (34.7)
Private/Other	593 (44.6)	659 (44.9)	942 (40.8)
Total	1331	1466	2311

[a] Based on 1991 Landsat TM classified imagery and early 1990s public ownership patterns derived from the Michigan County Map Guide (early 90's edition). Ownership database has significant positional and parcel inaccuracies, but was deemed suitable for analysis at the scale of the entire UP.

[b] Hemlock, black spruce, white spruce, balsam fir, white cedar, and mixed conifer classes with > 70% crown closure.

[c] Exclusive of mixed hardwood/conifer classes.

Total area of UP (minus Isle Royale) = 16587.6174 sq. miles
Percent of UP in Conifer Cover = 13.9%
Percent of UP in Non-Pine Conifer Cover = 8.9%
Percent of UP in Prime Wintering Habitat = 8.0%

Figure 13: image of table summary in data set described above.

DNR_2000_wup_dwc_draft_v2000nov (information only):

These data were done with a combination of hardcopy maps and aerial photos, site observations or local staff familiarity over time, and GIS. The western upper peninsula (WUP) and eastern upper peninsula (EUP) were two different WLD supervisory regions, at the time of project work. Data work done 2003 July 18 and checked then completed. However, the draft data was found to be a mix of the various "deer yard" understandings or delineation methods and the "deer wintering complex" concept, so the draft didn't completely pass various internal reviews and needed more work. This data set lead to the 2003 WUP data set version, and therefore is not included as an actual separate data set more than this comment in case there are questions (or an internal local copy of the data set is found, etc.).
Add additional information, but not as critical immediately 2021may as not included in combined layer.

DNR_2000_eup_deerareas_dwc (polygons):

These data were done with a combination of hardcopy maps and aerial photos, site observations or local staff familiarity over time, and GIS. The western upper peninsula (WUP) and eastern upper peninsula (EUP) were two different WLD supervisory regions, at the time of project work. Data work was started early in 2000 on hardcopy maps, then converted to digital GIS data polygons 2002 Aug. 02, checked and completed. Note this is just the east UP when the EUP and WUP were different supervisor regions, and resulted in different management approaches, internal reviews, etc. being used in EUP versus WUP.

There is actual overlap in southeastern Delta county, between the 2003 WUP data set and the 2000 EUP data set (this set) for DWC, where there is slight difference in how the polygons were delineated in that overlap.

- Source: combination of hardcopy maps and aerial photos, site observations or local staff familiarity over time, and GIS. Scale is anticipated approximating ~1:8,000 to 1:12,000 development.
- Data spans the counties of: (EUP as shown below) eastern Alger (split northward along the SE Alger-Schoolcraft county edge line), southeastern Delta, Schoolcraft, Luce, Chippewa, and Mackinac. Not included are counties of: rest of the upper peninsula (EUP) and lower peninsula counties.
- Data quality / detail: good.
- Comments: (more notes coming, from notes in bad formats, duplicated -M.Strong 2021-05-11). Data fields: 36 features / polygons.
    - Field named "FID" (a default field in shapefiles): unique object Id for the 36 polygons.
    - Field named "Shape" (a default field in shapefiles): polygon.
    - Field named "ID" (a default field in shapefiles): all are "0", identifying as area on map and legend but better field for matching descriptive legend is next field "Area_ID".
    - Field named "food_condi" for food condition, planned for a single digit number designated by a 1, 2 or 3 like previous methods, but not all completed so values "0".
    - Field named "food_con_1" planned for text food conditional description short string, of "good", "medium" or "poor" and which corresponds to the numerical field above (1, 2 or 3) like previous methods, but not all completed so values are empty"".
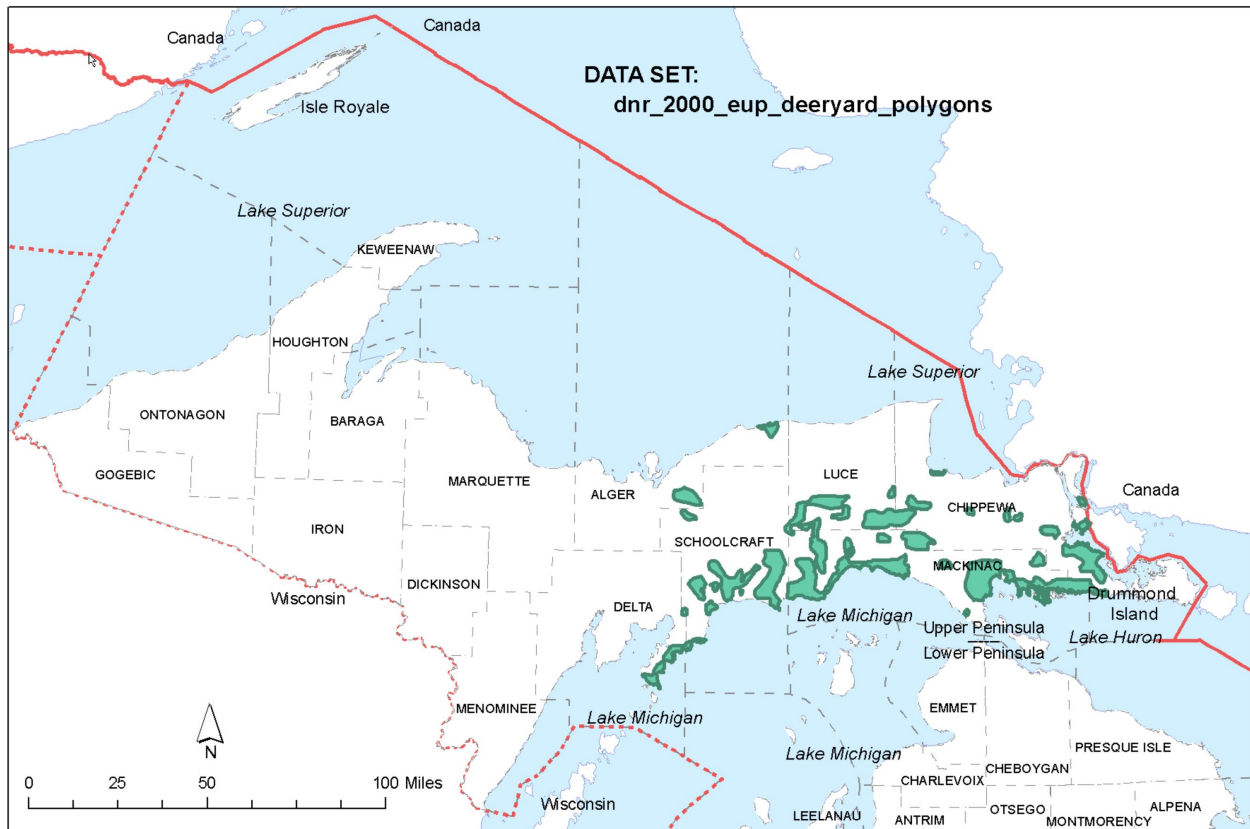- Additional Notes: (none at this time, date of document).

Figure 14: map figure of 2000 EUP data set described above.

DNR_2003_wup_deerareas_dwc_draft_v2003nov (polygons):

Data work was starting early in 2000 on hardcopy maps, then experienced problems with differences in methodology, then converted to digital GIS data polygons 2003 Nov. 18, checked partially yet never officially completed by WUP (supervisor sign-off). Note this is just the west UP when the EUP and WUP were different supervisor regions, and resulted in different approaches being used in east versus west. The WUP data was not officially finalized until 2005 (late fall ~ Nov. 04 to Dec. 06) and for a requirement by NRC to WLD; there are some minor differences in the WUP 2000 draft set, 2003 draft set, and 2005 final set – particularly in conditional descriptive values of specific polygons (which were not methods used in EUP 2000).

There is actual overlap in southeastern Delta county, between the 2003 WUP data set (this set) and the 2000 EUP data set for DWC, where there is slight difference in how the polygons were delineated in that overlap. The 2003 draft version was near complete or considered really complete, shared for use, but not finalized in documentation because regional supervisor wanted more internal review after discussion with regional area's local staff. The 2003 WUP set directly relates to the passed-review and improved 2005 finalized version of the WUP data.

- Source: combination of hardcopy maps and aerial photos, site observations or local staff familiarity over time, and GIS. Scale is anticipated approximating ~1:8,000 to 1:12,000 development.

- Data spans the counties of: (WUP as shown below) Keweenaw (excluding Isle Royale), Houghton, Ontonagon, Gogebic, Baraga, Iron, Marquette, Dickinson, Menominee, Delta, and western Alger county (split northward along the SE Alger-Schoolcraft county edge line). Not included are counties of: rest of the upper peninsula (EUP) and lower peninsula counties.
- Data quality / detail: good.
- Comment: (more notes coming, from notes in bad formats, duplicated -M.Strong 2021-05-11).
- Data fields: 63 features / polygons.
    - Field named "FID" (a default field in shapefiles): unique object Id for the 63 polygons.
    - Field named "Shape" (a default field in shapefiles): polygon.
    - Field named "ID" (a default field in shapefiles): all are "1", identifying as area on map.
    - Field named "Shape_length" (a default field) length of perimeter in meters.
    - Field named "Shape_area" (a default field) area of polygon in square meters.
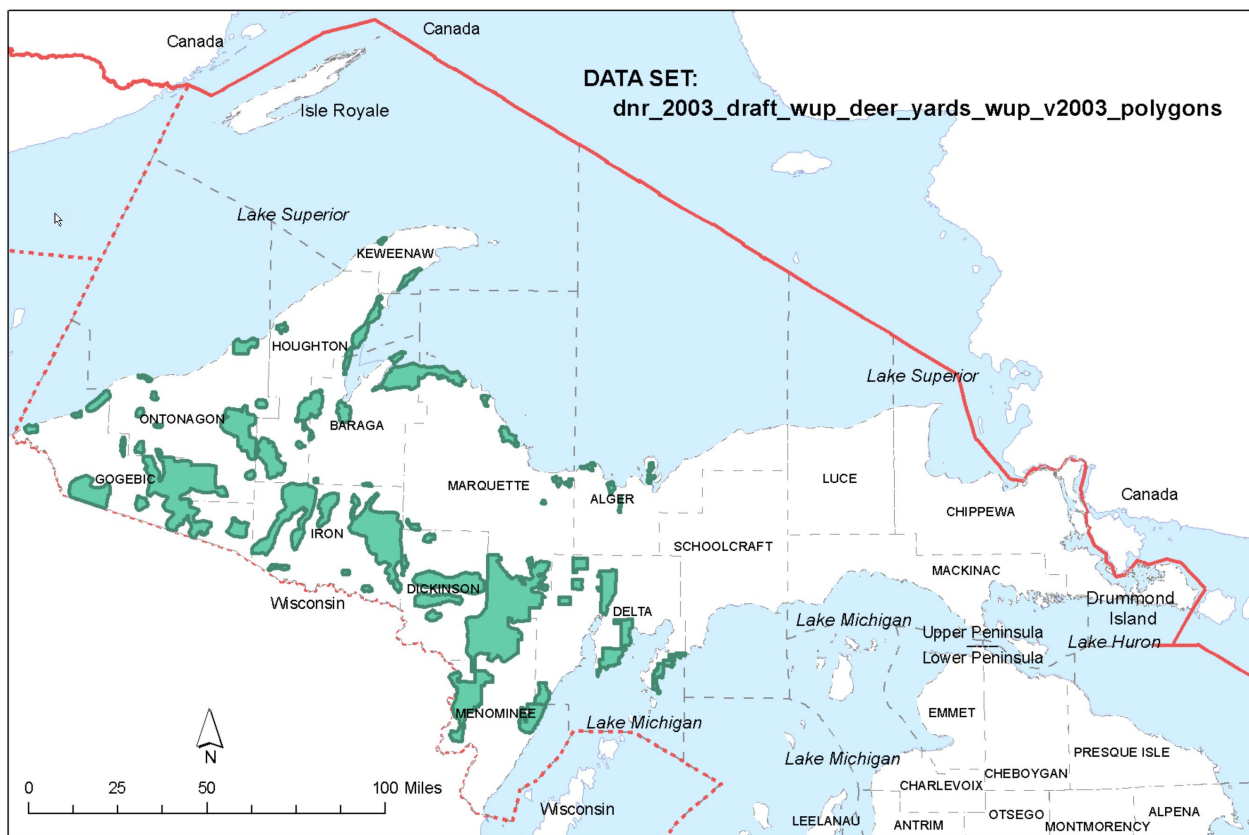- Additional Notes: (none at this time, date of document).

Figure 15: map figure of 2003 WUP data set described above.

DWC_2005_up_dwc_final2000-2005mix (polygons):

Data is a combination of areas designated and based on county surveys in 2000 in the east UP and 2005 in the west UP. This is combination data set where the methods differ about half-way across the upper peninsula, where the regional divider is for the WUP and EUP WLD Supervisory areas.

Data combination was created starting earlier in 2005, then passed to regional staff to check or comment, then finalized and packaged 2005 Nov. 04 to 2005 Dec. 06, and packaged with explanatory text explaining the way both classifications (WUP and EUP) worked. Data quality is good , due to methodology, review on local levels, etc.

During 2000-2005 DWC data development work, regional to local projects were initiated to identify the landscape-scale concentration sites of deer during the winter period in the Upper Peninsula (UP) of Michigan. This recent effort represents the first formal, detailed landscape scale or small-scale mapping effort of winter deer concentration areas and associated deer wintering complexes since DNR "deer yard" maps were produced in 1977-78. The scales and methods used to create the earlier individual winter "deer yard" maps appear to have varied across the state; previous products may not have identified deer wintering complexes by the same criteria, and are thus considered approximate representations of potential deer wintering complexes. The various years (1962 to present) do have differences in how areas were identified and scales of reference information (i.e. scale of aerial photography, flyover height, site visits, etc.). There are differences in the 2000/2001 East UP and 2004/2005 West UP project delineation methods. Methods and scales of data development have improved over time; in the map legend, the West UP areas have a briefly described conditional index which is described in more detail in a developing document. Avoid a strict direct comparison between the previous approximations and current approximation – the information is durable on regional to county scales, but not durable at fine-scale comparisons. Other information presented earlier in the inserted DWC explanation particularly applies to this data set, for sections relating to winter climate, forest cover, past patterns and behavior conditions of habituated deer herd population clusters and individual deer, and ecological conditions.

> The 2000/2001 DWC approximation for the East UP, is an updated version, with minor edits from 2000 EUP data set post-review. Essentially although not classified as such, the EUP polygons roughly or approximately correspond to the WUP category A description (below) for the north half of the EUP and category B description (below) for the southern half of the EUP.

> The 2004/2005 DWC approximation for the West UP, is an improved version of the 2003 WUP data with some smaller-scale data refinements due to improved input information and improvements in delineation methodologies, and where the areas are identified in the following 4 categories relating to deer concentrations, landcover or habitat type, and snow during winter:

> - o Category A= Deer Concentration Area Type 1: in northern most portions of the WUP, strongly associated with historical hemlock-hardwood wintering complexes.
> - o Category B = Deer Concentration Area Type 2: in WUP in northwest Dickinson l::a:iQ and Iron Counties: areas changed considerably since 1977-78, primarily northern white cedar wintering complexes, additional effort is needed to refine information.
> - o Category C = Deer Concentration Area Type 3: in WUP northern Menominee and southwestern Marquette counties: predominately northern white cedar and upland hemlock, boundaries discemable but areas highly fragmented because of timber harvest activities, additional effort needed to refine information.
> - o Category D = Deer Wintering Area Type 4: WUP southcentral WUP, in the mild winter with low snow depths, the current configuration of deciduous-dominated stands providing browse juxtaposea with lowland conifer and with associated agriculture apparently represents optimal wintering conditions for deer..

- Source: combination of hardcopy maps and aerial photos, site observations or local staff familiarity over time, and GIS. Scale is anticipated approximating ~1:8,000 to 1:12,000 development, but actual data development attempted to use even smaller-scale details in order to ensure combinations of information which resulted in scalar relationships larger than the smaller-scale, would be the end result.
- Data spans the counties of: (the upper peninsula) Keweenaw (except Isle Royale), Houghton, Baraga, Ontonagon, Gogebic, Iron, Marquette, Dickinson, Menominee, Alger, Delta, Schoolcraft, Luce, Chippewa, and Mackinac. Not included are counties of: the entire lower peninsula, plus assumed except Keweenaw county, Isle Royale (Federal land) as most delineations do not include Isle Royale.
- Data quality / detail: good, the best to date in 2005.
- Comments: (more notes coming, from notes in bad formats, duplicated -M.Strong 2021-05-11).
- Data fields: 95 features / polygons.
    - Field named "FID" (a default field in shapefiles): unique object Id for the 95 polygons.
    - Field named "Shape" (a default field in shapefiles): polygon.
    - Field named "ID" (a default field in shapefiles): all are "1", identifying as area on map.
    - Field named "Shape_length" (a default field) length of perimeter in meters.
    - Field named "Shape_area" (a default field) area of polygon in square meters.
    - CORRECT THIS SECTION w/ EUP and WUP blocks – 2021may12pm, M.Strong
- Additional Notes: (none at this time, date of document, but expect more will be added).
    - .

Add data view screenshot

Figure 16: map figure of 2005 data set described above.

2006 DWC term required definition, so definition created, in internal review, vetted and finalized (information only): Several meetings occurred with public contacts, including DNR and NRC open meetings, deer management plan open-houses, and similar discussions which showed that the term "deer yards" was understood and defined different ways by wide variety of members of public, lay-scientists, published professionals, professional publications, etc. and in order to resolve the problem in communication, the term "deer wintering complexes" (DWC) was clearly defined and what should be or will be used by DNR Wildlife Division.   Information presented earlier in this document before the data set listings, applies here and is not repeated. See the inserted DWC explanation and accompanying map, earlier in document, 2006 version, and later revised between 2006 and 2012, plus later.

_____

DNR_2012_deer_wintering_complex_explained_final_vetted_text (information only): This is an update required and completed on the same earlier DWC explanation/ definition **which actually did not change.** The edits required were for ADA/ accessibility formatting, DNR representation (as old DNR motto no longer a standards, and the interrupt 1-year DNRE logo didn't apply as returned back to DNR agency logo, plus add DNR website, etc.).   This comment mentioned here to ensure clearly

communicating information over time, and that the DWC approved explanation still valid … including through 2018, 2020-2021, etc.

DWC_2013_up_dwc_2layers_conditional (polygons):

This data set is really two layers of

      DNR_2013_up_dwc_data   **(polygons)** across entire upper peninsula (UP) and
      DNR_2013_up_conditional_dwc (polygons) in southern-central UP.

Data is based on a county based mapping effort using the 1978, 2000 and 2005 data as starting points then continuing local small-scale considerations from those resource data layers. Polygons were also verified where possible using site observations, survey data, pellet data and other sources. This was the first attempt at defined conditional range as well.

The "DNR_2013_up_dwc_data" spans across the entire upper peninsula except Keweenaw Co., Isle Royale. The "DNR_2016_up_conditional_dwc" represents the southern UP where snow depths are moderate and deer are generally found throughout the landscape in winter. Defined for the first time in 2013 but based on a variety of information resources and passed internal local review. The northern boundary is expected to be flexible or likely changes, moving north or south depending on the severity of winter conditions within a given winter or short number of winters (relating to browse recovery).

Information below applies to both individual sets.

- Source: combination of hardcopy maps and aerial photos, site observations or local staff familiarity over time, and GIS. Scale is anticipated approximating ~1:8,000 to 1:12,000 development. Similar description as above in the 2005 UP set…. add additional info.
- Data spans the counties of: (the upper peninsula) Keweenaw (except Isle Royale), Houghton, Baraga, Ontonagon, Gogebic, Iron, Marquette, Dickinson, Menominee, Alger, Delta, Schoolcraft, Luce, Chippewa, and Mackinac. Not included are counties of: the entire lower peninsula, plus assumed except Keweenaw county, Isle Royale (Federal land) as most delineations do not include Isle Royale.
- Data quality / detail: good to best to date in 2013.
- Comments: (more notes coming, from notes in bad formats, duplicated -M.Strong 2021-05-11).
- Data fields: 95 features / polygons.
    - Field named "FID" (a default field in shapefiles): unique object Id for the 95 polygons.
    - Field named "Shape" (a default field in shapefiles): polygon.
    - Field named "ID" (a default field in shapefiles): all are "1", identifying as area on map.
    - Field named "Shape_length" (a default field) length of perimeter in meters.
    - Field named "Shape_area" (a default field) area of polygon in square meters.
    - CORRECT THIS SECTION w/ EUP and WUP blocks – 2021may12pm, M.Strong
- Additional Notes: (none at this time, date of document, but expect more will be added).

      Conditional DWC or winter range was classified as:

      CORRECT THIS SECTION w/ EUP and WUP blocks – 2021may12pm, M.Strong

Figure 17: map figure of 2013 data set described above.

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Figure 18: map figure of 2013 data set described above

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DNR_2014_deerwinterrange_draft_~incomplete (information only): add additional information, but not as critical immediately 2021may as not included in combined layer.

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DNR_2016_dwr_model (deerwinterrange) GRID format data (information only):

These data are not polygon format, so not included here, yet as of version of these notes (will require conversion and qaqc check of converted data) these data are directly related to the above set 2014 DWR draft ~incomplete, and the next data set below.
DNR_2016_dwr_model is in ESRI GRID format data (appears like an ESRI old COVERAGE format, but is a raster format file) … Started earlier in 2016, completed in 2016 May 25.

"DWR_model", this grid layer represents a GIS model of deer winter range suitability based on winter severity and the availability of cedar and hemlock. Input layers used were the ZEDEX snow data and the FIA cedar and hemlock dominant vegetation pixels. The result is a grid with values from 1-9 with 1 being the least suitable for wintering deer and the 9 being the most suitable. This layer was used to help determine areas that might have been missed in DWC mapping in 2013. It can also be intersected with various tree species grids to create browse vulnerability maps.

This data set is internally on the DNR GDSE centralized GIS server, and not included here due to compatibility related to formats, etc. – however, as said, the information relates to the next polygon data set.   … add additional information, but not as critical immediately 2021may as not included in combined layer.

DNR_2016_dwr (deerwinterrange): This is the 2013 layer with some minor updates to remove some small areas that do not support deer as well as merging polygons into logical named DWC's. The conditional range polygon was added to provide a UP wide deer winter range layer.

- Source: similar to the 2005 UP data set in section above.
- Data spans the counties of: Houghton, Ontonagon, Gogebic, Baraga, Iron, Marquette, Alger, Schoolcraft, Luce, and Chippewa. Not included are counties of: Keweenaw, Dickinson, Menominee, Delta, Mackinac, and the entire lower peninsula (LP). … plus assumed except Keweenaw county, Isle Royale (Federal land) as most delineations do not include Isle Royale.

Plans were for an update that would span the counties of: (the upper peninsula) Keweenaw (except Isle Royale), Houghton, Baraga, Ontonagon, Gogebic, Iron, Marquette, Dickinson, Menominee, Alger, Delta, Schoolcraft, Luce, Chippewa, and Mackinac. Not included are counties of: the entire lower peninsula, plus assumed except Keweenaw county, Isle Royale (Federal land) as most delineations do not include Isle Royale.

- Data quality / detail: good, again believed the best to date in 2016.
- Comment: (more notes coming, from notes in bad formats, duplicated -M.Strong 2021-05-11).
- Data fields:
    - Field named "FID" (a default field in shapefiles): unique object Id for the 95 polygons.
    - Field named "Shape" (a default field in shapefiles): polygon.
    - Field named "ID" (a default field in shapefiles): all are "1", identifying as area on map.
    - Field named "Shape_length" (a default field) length of perimeter in meters.
    - Field named "Shape_area" (a default field) area of polygon in square meters.
    - CORRECT THIS SECTION w/ EUP and WUP blocks – 2021may12pm, M.Strong
    - Name – DWC name
    - Category – code used in a winter range priority process developed by the UPHW in 2015
    - Snow12 – number of average days each winter where snow depth > 12 inches. From the ZEDEX climate database
    - Shelt_maj – what winter shelter species makes up the majority
    - Shelter ratio – ratio of winter shelter to food in the DWC
    - Notes – notes of importance on the DWC. Filled out for DWC's where occupancy is suspect and a plan was not developed
    - Manage_dir – management direction from the UPHW DWC management plans
    - UPHW_plan – was a UPHW strategic DWC plan developed?
    - MDNR_plan – was a DNR state forest DWC plan developed?
    - CHECK THESE FIELDS, ABOVE – 2021may12pm, M.Strong
- Additional Notes: (none at this time, date of document, but expect more will be added).

Add data view screenshot (but not as critical immediately 2021may as not included in combined layer).

Figure 19: map figure of 2016 data set described above

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Attribute Fields of the Combination Single Layer Containing All Data Sets:

Below is a listing and explanation of the type and contents of the data fields in the combined single layer (ESRI ArcGIS file geodatabase layer or SDE layer, or later planned for Arc Portal layer). The single layer, planned as "deer_wintering_areas_dwc_historical" (or "DNR-WLD_deer_wintering_areas_dwc_historical") is meant to be developed as a data container that will hold and have other data added such as if locate more data or more newer years' data developed. Plans are this authoritative data layer from DNR Wildlife Division, served and managed by WLD staff specialists, will be available internally for staff plus externally facing public and cooperating researchers, etc.

Field type selection follows the rule that if two number-appearing items are added together, and make no sense, then they shouldn't be a number but are a text-string; and example is the years 1972 and 1999 which appear as numbers but are really numbers as text-string labels / information, because when you add 1972 to 1999 the answer doesn't make any sense. Using text or string format fields also provides additional flexibility for what information can be added to that field.

As this data set has recently been compiled and more notes review is ongoing, these data are subject to change particularly for attribute fields which may be blank (either "<null>" or just blank, no values) but the fields with attributes from individual data sets (like those listed earlier) should be stable as they are systematically moved to the new combination layer attribute fields (and as listed below).

For more information on attribute data field specifics regarding formatting, etc. see the ESRI software company website at http://www.esri.com and search on "attribute data fields" in the support information section; this document will not list all those specifics when they are more appropriately and more completely described by the ESRI software GIS provider.

Entries below are listed in format of:
[attribute field name], field-type, size = description, etc. and for specific legacy data sets, it lists where the unique data set field was moved when compiled the multiple historical / legacy layers to a single data layer. In the portion to right of the equal-sign, in listing below, proper field names should be in brackets (like [field_name], for example), and some descriptive information provided relating to data sets listed earlier can be a calculated combination of fields as indicated. Many of these attribute fields, named on far-left-side of list below, are considered a developing practice or standard-usage WLD data fields which we're using for GIS data layers.

- **The following are software standard or default**-included attribute data fields, per layer for ESRI file-geodatabase feature layers, etc. Note that users cannot edit the first two fields, can only update the shape length and area during feature management / edits (changes are calculated by software) and cannot delete these minimum layer fields.

[FID] or ObjectID , large integer (positive) number = a system / software managed unique identifier for
                                            every polygon feature in the data layer.
[Shape] , (type is "geometry" but appears a text) = identifies within software the type of feature, and
                                            software doesn't mix polygons, lines or points.
[Shape_length] , double-precision numeric ,   = length of the specific feature, or outline, in meters*.
[Shape_area] , double-precision numeric ,   = area of the specific feature, or polygon, in sq.meters*.

                                       * Units are meters because the GIS data layer map
                                       project, datum, and setup result in units being meters.

- **The following are custom attribute fields specific to this subject data layer:**

  (Note that fields indicated in <mark>green highlight backshade</mark> are recommended fields for starting use of this data layer.

    <mark>(RECHECK THESE FIELDS, BELOW, for 2003, 2005 and 2013 attrib fields reorg./moved are documented correctly just to ensure documented well. – 2021may12pm, M.Strong</mark>

[valid_as_deer_wintering_area] ,text, 3 = "yes" (allowing "yes" or "no", etc.)

[data_set_name]   , text , 256   = "DNR_1928 deeryard_up_dwc_polygons"

[data_set_year]   , text , 16   = "1928" but can be a range
          (NOTE: replaces std field named "year" , short interger , ? = data set year??? (can be multiple years)).

[data_set_source_yrs] , text , 25   = short field text string on year(s) of source data
          = 1928 [years] (example: "1928, 1929, 1930").

[feature_label_short] , text , 50   = field purposefully made to use as short feature label like in
          GIS auto-label functions
          (example: "???? deer wintering area").

[feature_label_long]   , text , 256   = field purposefully made to use as short feature label like in
          GIS auto-label functions
          (example: "???? deer wintering area (dwc name)"
              where "dwc name" is text from field
              [feature_localname]
          = 1928 datsetname + 1928 dwc

[year_feature_developed] , text , 50   = data set source year or years (can be multiple years);
          See [data_set_year] or [data_set_source_years] plus
          maybe year before as planning started typically earlier.

[year_feature_applies] , text , 50   = data set source year or years (can be multiple years);
          "use final dev. year, unless newer data available"

[feature_purpose]   , text , 256   = comment explaining purpose of the feature
          (example: "identify deer wintering related areas or deer
          wintering complexes (DWC; read DNR-WLD definition)
          over time, in one layer, facilitating use").

[feature_comment]   , text , 256   = comment on specific feature
          (example: "multiple fields may have been provided, see
          other fields in this attribute table for this polygon") …
feature shorter description based on data set year/project
1928 "core deeryard or deer wintering area (very conservative estimate)";
1937 "deeryard or deer wintering area (conservative estimate)";
1950s "deeryard or deer wintering area (estimate)";
1962 "deeryard or deer wintering area (estimate)";
1967 "deeryard or deer wintering area (estimate)";
1977to1978 up "deeryard or deer wintering area (estimate)";
1977to1978 slp "core deeryard or deer wintering area (very conservative estimate)";

2000 eup "deeryard or deer wintering area (estimate)";
2000-2001/2005 eup (in 2005 up data set) "deer wintering complex (estimate)";
2003 wup draft "deer wintering complex (estimate)";
2004-2005 wup (in 2005 up data set) "deer wintering complex (estimate; with subcategory/type)";
2013 up data "deer wintering complex (estimate; with subcategory/type, and conditional south-up area)".

[feature_localname]   , text , 64   = local name for feature like if area has a "name", can be blank for some data in this set
= 1928? [dwc] (txt 44)   ;
2013 up dwc (but not the 2013 conditional up layer) [name] (txt 50)

[feature_food_condition_class] , text , 64   = abbreviation, code or short identifier for the polygon "food condition" as provided in some of the specific data sets (but not all of them) and is typically paired with a "food condition description" (below).
= 1950s [quality] (txt 15);
1962 [food_condi] (num short);
1967 food_con_1 (num short);
2000eup food_condi (num short); … or "(no data)".

[feature_food_condition_descr] , text , 256 = free-form text description for the polygon for "food condition" as provided in some of the specific data sets (but not all of them) and is typically paired with a "food condition code" (above).
= 1950s [quality] (txt 15);
= 1950s [fod_cndtn] (txt 100);
1962 [food_cond_1] (txt 10);
1967 food_con_1 (txt 10);
2000eup food_con_1 (txt 10). … or "(food condition was not assessed in this year * project)"

[feature_pop_low_estimate] , short integer , = minimum or low-value number or identifier including numbers (as can include a range like "25-35") for polygon population estimate
= 1977-1978 slp [low_estima];

[feature_pop_high_estimate] , short integer , = high-value number or identifier including numbers (as can include a range like "25-35") for polygon population estimate
= 1977-1978 slp [high_estim];

[feature_pop_comment], text , 256   = free-form text description relating to population estimate
= 1977-1978 [comment] (str txt 100)
or allows "(unknown)" or "(not estimated)" or "population was not estimated as part of this year * data development task".

[feature_description]   , text , 256   = description of the feature re habitat, etc. [description];
                                             Note this field varies widely based on which individual
                                             data_set_name layers included a "description" field
                                             specifically or implied, etc.

[feature_dev1_abbrev] , text , 128   = variable identifier field for data development, code, set, etc.
                                             = 2005 [type]; 2005 final wup [label]

[feature_dev1_comment] , text , 256   = free-form text comment re: data development
                                             = 1977-1978 [survey_id] (calc= "survey id = " +
                                             [survey_id]); 2005 [label short]; 2005 final wup (calc=
                                             "(2005 wup) conditional dwc type " + [type] + " ; type
                                             label " + [label]) ; 2013 conditional up [migration]
                                             ("conditional");.

[feature_dev1_comment2] , text , 256   = free-form text comment re: data development , as some have
                                             multiple comment blocks or fields assembled into a comment
                                                  (for 1977to1978 "food conditions were not estimated
                                                  as part of this year * data development task") ;
                                                  2005 [label long] ;   2005_final_wup (calc= "(2005 wup)
                                                  cnt_type " + [CNT_TYPE] + "; percent " + [PERCENT] + " ;
                                                  percentofy " + [PERCENTOFY] + "; pct_of_wup " +
                                                  [PCT_OF_WUP]);.

[feature_dev1_comment3] , text , 256   = free-form text comment re: data development , as some have
                                             multiple comment blocks or fields assembled into a comment

[feature_dev1_note]   , text , 256   = free-form text comment field specific for data development
                                                  versus polygon/ feature information in the earlier 3
                                                  comment fields listed directly above
                                                  = 2005 [metadata];

[feature_dev1_datewho], text , 128   = for feature data development step1, identifier who did work
                                                  = 2005 up [data_sourc] + [data_sou_1];

[feature_dev2_notes]   , text , 256   = like [feature_dev1_note] above, but for dev. step/stage 2.

[feature_dev2_datewho], text , 128   = for feature data development step1, identifier who did work
                                                  = 2005 up [data_updat] + [data_upd_1];

[feature_data_quality]   , text , 64   = use for description of data quality;
                                                  "good, but older data may be poorer due to older
                                                  methods or data".

[feature_recom_scale]   , text , 64   = use for comment on recommended scale for this feature.
                                                  "county to regional/or larger for older data; new data
                                                  ~6x6miles" …
                                                  "Recommended scale of use is county to regional or
                                                  above for older data, newer data may be usable at
                                                  political township (6x6 miles), but beware or use care
                                                  for using polygons overlapping in space but different
                                                  development years and methods." … did not fit (sorry -
                                                  M.strong).

[species_common_name] , text , 75   = common name of species re data set; or "white-tailed deer"

[species_scientific_name] , text , 150   = scientific species name re data set, or "Odocoileus virginianus"

[species_reference_URL] , text , 256   = URL to site about spp (use wikipedia as no easy url for
MDNR https://en.wikipedia.org/wiki/White-tailed_deer

[data_metadata_ref_URL] , text , 256 = URL to metadata for data use metadata folder on dnr ftp site =
"http://www.michigandnr.com/ftp/wildlife/wildlife_req
uested_geospatial/metadata_only/DNR-
WLD_deer_wintering_complexes_dwc_legacy_data_19
27-current_info-metadata.pdf"

[data_source_label] , text , 256   = free-form text field description of data set source, or citation =
"DNR. 2021. DNR-WLD Deer Wintering Areas Complexes
(DWC) historical data (digital geospatial data) and
documentation-metadata (Adobe PDF file). State of
Michigan, Dept.of Natural Resources (Wildlife Div.),
Lansing, Michigan, USA. http://www.michigan.gov/dnr

[data_warning_y_or_n] , text , 3   = "yes" if data warning, then put in "data_warning_comment";
If "no" then expect field [data_warning_comment] to
be an empty field.

[data_warning_comment] , text , 256   = free-form text field for data set notes, not polygon notes;
see comments above for [data_warning_y_or_n].

[data_mgmt_comment], text , 256   = free-form text field for data set notes, not polygon notes;
Typically being used for data update information.

[data_local_check] , text , 6   = a multi-purpose check field during qaqc, etc.; temp field.

[data_internal_check] , text , 6   = a multi-purpose check field during qaqc, etc.; temp field.

[data_lastupdated_date] , text , 25   = date of last updated / change in feature, in format like
####-##-## or year-mo-dy for minimum format (of year in 4
digits, then a dash, then month in 2 digits, then dash, then day
in 2 digits …) and can add time if needed (add a dash then
time in 4 digit 24hr format, eastern standard time), and
possible to add a version letter or number (add a dash then
additional code); examples:
2021-05-12, 2021-05-11-1227, 1879-05-12-1435-v7a, etc.

[data_updateby_userid], text , 25   = use for identifying who did the last update (field directly
above or to the left of this field); example
"DNR-Wildlife Div.(M.strong)"

[acres] ,double-precision float number, = area in acres of current polygon calculated from meters
units of geospatial data .

[sq_km] ,double-precision float number, = square kilometers of current polygon calculated from meters
units of geospatial data .

[sq_miles] ,double-precision float number, = area in square miles of current polygon calculated from
meters units of geospatial data .

… reminder of earlier-listed default fields …

[shape_length] ,double-precision float number,= perimeter of polygon in meters units of geospatial data
layer (see comments earlier for this data field).

[shape_area] ,double-precision float number, = area in square meters units of geospatial data layer
(see comments earlier for this data field).

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The following or rest-of-document is an Internal section and may be pruned off distributed versions of this document (explained below); check back to this document for updates as the notes are resolved.

Internal section – or a "parking-Lot" of Other Notes – note these may be pruned-off for distributed documentation, to avoid a huge file as the inserted notes may be duplicates, may not be in the best spacing for formatting, may use names of others not relevant to the documentation or current positions, or otherwise add mass without improving understanding by unfamiliar readers. Removal off distributed versions of the document will greatly shorten the file for unfamiliar or external readers.

> The "parking lot" portions include:
>> Chronological notes on data development, pasted-in readme files, unformatted raw notes, emails, etc. expected to assist final metadata creation, etc. (and so notes in one location). Any other notes, screen shots, possible duplicated information, citations, etc.

It's planned that as this documentation gets finalized and to more formal and detailed, standardized geospatial metadata, that the rest of this document will either end up moved to other portions above or in the metadata, or be deleted (being redundant, not actually applicable, or otherwise not relevant to this document information).

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