NEW HAMPSHIRE NATURAL HERITAGE BUREAU

What you should know before using NH Natural Heritage data

Not just rare species.
Heritage programs keep track of "exemplary" natural communities and natural community systems, as well as rare plants and animals.

- Natural communities are collections of species that tend to occur together, given certain landscape conditions, e.g., a hemlock - white pine forest.

- Natural community systems (also referred to as ecological systems) are particular collections of natural communities that recur in the landscape and are linked by common underlying or driving forces, e.g., a salt marsh system that includes both high and low salt marsh communities.

An "exemplary" natural community system is one that is unusual in its size, quality, or type. Most examples of rare types are considered to be exemplary. So are large and undisturbed examples of common types.

Kinds of rarity: federal lists, state lists, expert rankings.
What species are rare enough to be tracked in the NH Natural Heritage database?

- All species federally listed as Threatened or Endangered.

- All species officially listed as Threatened or Endangered in New Hampshire.

- Species that are not (yet) officially listed by the state, but that are judged by experts to be at risk of extinction in New Hampshire.

NH Natural Heritage considers all species in the database to be important candidates for conservation. However, listing status and conservation rank can be used to judge relative priorities. Also, regulatory protections are different for these different categories.

Recent data are better quality!
Most of the information in the database comes from recent field surveys. In many cases, the field notes are very detailed. In contrast, quite a few records in the database are from specimens collected as far back as the 1800s. Just because a record is old doesn't mean the species is no longer present - we've relocated a rare orchid that was last seen 99 years ago. However, species do go locally extinct. The YEAR or LASTOBS fields must be considered when using Heritage data.

Some observation locations are more exact than others.
The only location information on older records is often a town name. But even recent reports cannot always be exactly mapped in our database ("… continue on Smith Road to a white house on the left."). The polygons provided by Heritage cover our best guess of the actual observation site, *plus an uncertainty buffer*. The PRECISION field (S = high precision) is a very important field to check, right up there with YEAR.

Be very careful when making specific locations public!
Protecting these elements of biodiversity is important. Release of specific locations can lead to loss of occurrences, e.g., through unscrupulous collection. General rule: never release more exact information than is needed to accomplish specific conservation goals. *Regardless, never make public the location of a "sensitive" occurrence without first consulting with NH Natural Heritage*: check the SENSITIVE field.

Observed location vs. necessary habitat.
It is very important to understand that we map *observed locations*, not habitats. A turtle found dead on a road appears as a point at the side of the road. The local population of that turtle needs nearby wetlands, not roads, to survive. Similarly, plants, natural communities and systems may be hurt - or helped - by what happens on adjacent lands. Mapped locations in the Heritage database should be used as starting points for conservation decisions, not end points.

Answers to Two Very Basic Questions:

Is a rare species or exemplary natural community present within each polygon?

Not necessarily. There are two other possibilities.

1. The occurrence used to be there, but is no more. Small populations of rare plants may have died out. Rare animals may have shifted their home territory.   Natural communities may have been altered by development or natural disturbances. Check the YEAR or LASTOBS field for how long ago the occurrence was known to be at this location.
2. The mapped location is wrong. We use extensive quality control to prevent this from happening. However, we may have received inaccurate directions. Or a mistake could be made during mapping. Along with the mapped polygon, check the DIRECTIONS, EODATA, and GENDESC fields for additional location information. If you encounter an error in the data, make a note of the problem and report it to NH Natural Heritage.

Do areas with no polygon have no rare species or exemplary natural community present?

This is not a conclusion you can reach from these data. Most areas have never been surveyed for biodiversity elements. The database is also constantly being revised, based on new information. Be aware of how long ago the data you are looking at were provided by NH Natural Heritage.

Basic Terminology - Know these Heritage buzz words!

Element

The "Elements of Biodiversity" that Heritage programs track include species and natural communities. "Element" is a shorthand for the major *types* of records in Heritage databases. (Some programs also track elements such as staging grounds for migratory birds. NH Natural Heritage currently tracks bat hibernacula and may in the future add other critical-habitat type elements.)

Element Occurrence (EO)

When an element is known to occur at a given location, and the occurrence meets certain standards, Heritage programs create an Element Occurrence Record (EOR) for that site.

- For plants, even a single stem will be considered to be an EOR (for how viable an EOR is, see "EO Ranks" below).
- For highly mobile animals - especially birds - in addition to a sighting there has to be some evidence that the area actually supports a viable population. For birds, this means there must be some evidence of breeding activity. In contrast, *any* observation of an animal that rarely travels far from its home habitat (e.g., a turtle) can become an EOR.
- For natural communities and systems, a particular occurrence is judged on its size, quality, and landscape context. There is a sliding scale for how good those values have to be before the occurrence is considered to be "exemplary" and made into an EOR. For a very rare type, even a poor-quality occurrence can qualify. For common types, the occurrence would have to be large, undisturbed, and in a relatively undisturbed area to become and EOR.

The EOR consists of a set of standard fields -e.g., Directions, Latitude & Longitude, Management Comments - that describe the location and condition of the occurrence.

How many occurrences are there in New Hampshire for a given element?

This is more complicated than it may sound. Many elements have "EO Specifications" that define how far apart two observations have to be to be considered separate EORs (e.g., separate populations).   The default distance, for elements with no EO Specification yet developed, is one kilometer. However, NH Natural Heritage does create EORs for observations that should be considered "sub occurrences". In particular, this happens when there is so much information, e.g., from many years of observation, that it would be confusing to fit it all into a single record. For some elements, we have used a SUBEO field to identify clusters of EORs that should be considered a single EO. Other elements, however, still need to

be reviewed and have SUBEO values assigned. We recommend that for analyses that involve counts of occurrences you consult with Heritage staff on how best to proceed.

EO Ranks: How good is an EO?
A single stem of a rare plant is an EOR, but is not highly viable, and may therefore not be a high-priority target for conservation. The field in the Heritage database that summarizes the viability of an element occurrence is EORANK: A = excellent viability, B = good, C = fair, and D = poor.

Ideally, EO ranks are relative to the entire distribution of the element. If EORANK is "A", then it is one of the best known occurrences anywhere in the world. In practice, the full range of an element is often not known, and detailed guidelines for assigning EO ranks have not been developed for many elements. EO rank is then either left blank, or assigned with a best guess, usually by someone with only local (New Hampshire only) experience with that element. When available, EORANK is a good guide to how viable a given occurrence is, but should not be used blindly. Check EODATA for more details, and if making comparisons at a regional or global scale treat EORANK with a grain of salt.

Representation
The mapped polygons of Heritage data are called the "representation" (rep) of the occurrences.
- To create a rep, we start by mapping the observed location as accurately as possible. This could be a point (e.g., for a small plant population or a single animal), a line (e.g., for mussels in a small stream), or a polygon (e.g., for a large group of plants, a mobile animal observed over an extended period, or a natural community).
- The final rep polygon includes this observation area *and* however much additional area is needed to account for locational uncertainty. For example, the rep for a GPS point collected by a sub-meter accuracy unit would be a circular polygon with a 12.5-meter radius (the smallest distance at which separate objects are portrayed on a 1:24,000 USGS topographic map), while the rep for a handheld GPS unit might be a circle with a 50-meter or even a 200-meter radius.

The final polygon thus may be much larger than the actual observation. This is obvious when it is a 1.5-mile radius circle (we had very little location information), but less so if the polygon is an entire wetland. *Check the* PRECISION *field*: "S" reps should be very to fairly precise, "M" reps will give only an approximate idea of the actual location, and "G" are very imprecise (e.g., only the town name is known). You can also check EODATA and EORANK for how many individuals, or how large an area, was actually observed.

Note: The actual representation is not released for species identified as being particularly at risk if their exact locations would become public knowledge. For these **sensitive species**, a grid of 400-acre cells is used to show their location. For any one occurrence, all 400-acre cells that intersect the mapped location are identified and combined into a single (possibly multi-part) polygon. When viewing polygons for sensitive species, you should keep in mind that the actual observation location(s) could be anywhere within the polygon, including at the edges.

Additional useful details:

What natural community or natural community system is present at a mapped polygon?

For many years, NH Natural Heritage used a classification developed by Rawinski (1984). In 2004, our ecologists published a revised natural community classification for New Hampshire, and in 2005 published a natural community system classification for NH. Both of these classifications can be found at www.nhnaturalheritage.org by choosing "Publications", then "Reports".

Most of the ecological records in the Heritage database have been assigned to the appropriate natural community (and/or system) under the new classifications.

How rare is the element mapped at a given site?

- Federally listed as Endangered or Threatened: NH_USESA = "E" or "T"

- Elements that are *globally* rare, meaning that occurrences in New Hampshire could be a significant part of the total known extent of the element: RND_GRANK = "G1", "G2", or "G3".

- Elements that are rare *in New Hampshire* (including globally rare ones): RND_SRANK = "S1", "S2", or "S3".

- Elements that are officially listed as Endangered or Threatened in New Hampshire: SPROT = "T" or "E". (This listing is slower to be updated than the SRank values, which are based on expert evaluation and do not require government approval.)