INFORMATION SUPPORT OF DEVELOPING OF «ALLOCATION, USING AND PROTECTION CHART OF HUNTING AREAS ON FEDERAL REGION TERRITORY»

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The order of RF Ministry of Natural Resources $(8/31/2010, N_{2}35)$ defines the maintenance of «allocation chart...» and maps and hunting grounds cadastre specification. The list of hunting grounds categories and types defines necessity of enough detailed representation of the forests, peatland, field and water categories which have no mapping on existing surveying materials.

It is evident that perceptions about spatial allocation of hunting grounds types are necessary for hunting farm differentiation and capacity assessment, for hunting grounds valuation, allocation of monitoring system, for protection organisation, etc. The map of the hunting grounds should be one of layers GIS «Hunting industry» and its proving base should create possibilites for different hunting grounds types area calculation for districts, municipal unions and the hunting farms. Problem solution in the volume defined by the order of RF Ministry of Natural Resources is possible only through basing on the remote multispectral satellite information with the spatial resolution 20-30 m. This scale is sufficient for intrafarm hunt planning. For region level is sufficient spatial resolution 100 m. The multispectral information reflects important for animals diversified properties of land surface, and allows to allocate almost all recommended types of the hunting grounds. Currently six-channel data from Landsat correspond to requirements of the hunting industry which free for all Russia territory.

For hunting grounds categories identification is used hierarchical dichotomizing classification by a method of K-means. It is the most expedient to use values of brightness normalized on a maximum. The first band (blue), in most cases it is possible to exclude from the analysis as it is very sensitive to the aerosols maintenance and a smoke and can bring in classification the unnecessary information.

Use of the dichotomizing scheme (step 1 – splitting all multitude into two classes, step 2 – splitting each class into two at the second level and etc.) provides full display of all variety and is realized in any statistical software. Commonly at first level allocated easily identified states: for example "field" and other. Further the field split mostly into fields and bogs, and "other" – on "water" and forest. At next level, each of classes split mostly on vegetation density or depth of a water. As a result, without the aprioristic information, it's possible to providing allocation of hunting grounds categories. There are the simple criteria allowing to specify their physical meaning based on brightness values in spectral bands and indexes.

For reception of hunting grounds maps at level of types and kinds it is necessary to develop regional tables of classification spectral representation for vegetation characteristics which essentially influencing distribution and hunting animals abundance. For this purpose, on a test site we need to create in region a sample of field descriptions of the vegetation, everyone from which it is positioned in geographical system of co-ordinates with accuracy provided popular GPS-receivers is created. Descriptions settle down so that to capture the most part of vegetation cover variety. This variety can be received on the basis of the same preliminary classification with allocation more than 100 states. Thus, for physiographic region it is necessary to make about 200-300 descriptions. Further for each of six bands for various states of vegetation are defined average values of the brightness expressed in percentage of a maximum: a participation of each tree species with step – 20 %, three-four age categories, as much height categories, a stock and density. Similarly considered height and bushes projective cover (for treeless territories), herbaceous layer, moss layer, etc. As a

result, each state on each variable is described by a vector of relative brightness. This attributive table allows with sufficient accuracy to define the maintenance of each state received as a result of dichotomizing classification with the permission from 128 - 256 states. After defined Euclid-distance of each state classification from corresponding vegetation characteristic states, we have an opportunity to define vegetation state everyone unit on map. On this basis it is possible to entitle each kind of the hunting grounds.

Spectral representation developing useful for all seasons of year, that will allow to use archive of Landsat scenes more fully. By this time based on the Tver region western part the table of spectral representation for all forest zone of the European part of Russia is created. In the report variants of maps of the hunting grounds made for Yaroslavl region are shown.

In mountain regions the typology of the hunting grounds can be under construction taking into account a relief. For this purpose convenient to use free heights maps in a raster format with the spatial resolution 100 m («The Shuttle Radar Topography Mission (SRTM)). Based on spectral analysis for territory hierarchical levels of the relief organization are allocated. For each level by software Surfer, Erdas or ENVI the steepness, an exposition and surface profiles calculated. Using the same methods of classification (dichotomy), allocate relief types. Hunting grounds kinds is received as a combination from two classifications.

For territories of Siberia the resolution 100 m can be in most cases superfluous. Here more effectively to use seven-bands measurements from companion Modis-Terra with the 500 m resolution. It is necessary to notice that only Landsat and Modis measure reflexion of a near infra-red part of a spectrum, very important for identification of moisture of a surface. The offered technology is accessible with use to binding to system of coordinates of scenes Landsat, aggregation of images to the spatial resolution about 100 m, export of a raster to a format of statistical packages (SPSS, Statistica> 6), return transport of results of classification in a raster format. The received maps of the hunting grounds can be presented as in raster, and a vector format, as independent products, and as GIS layer for example, in ArcGis or in Mapinfo.