1. INTRODUCTION:

This position is in the Land Management Planning Branch, GIS section, providing services at the National Forest level to natural resource managers in Geographic Information System (GIS) development, maintenance, and use.

1. DUTIES AND RESPONSIBILITIES:

The position serves as a Cartographic Technician providing general assistance in GIS operations on the Forest. System operation involves considerable hands-on computer manipulation of data files to provide map and data products for users. Duties of the position encompass the entire range of GIS involvement, from project conception and data compilation to final production of map and data products. The position is responsible for ensuring that GIS data are properly compiled to meet specified standards, and for selecting appropriate GIS techniques to produce required outputs in a timely and efficient manner.

Specific duties and responsibilities include:

- Assisting in the development of the Forest's GIS data, which include geographically referenced features and associated attribute data. Data is acquired from a variety of sources, including maps, aerial photos, Global Positioning System (GPS) measurements, satellite imagery, and existing data files, and must be converted to computer files (or coverage's) and databases usable by the GIS software system. Assistance will be in the form of preparing map manuscripts, digitizing and scanning, data conversion, editing and updating. The incumbent will be required to have a complete understanding of various cartographic techniques and computer programs to accomplish these tasks.

- Taking the lead role in the maintenance, edit, and update of the Forest’s transportation feature classes and data, including roads and the record of decommissioned roads, and maintaining a clean linkage between the route spatial data and the Infra database. Working with Engineering to keep the Infra road segment and Access Travel Management (ATM) database current.

- Cartographic design and production: Duties and responsibilities of the position require an understanding of traditional cartographic practices and the ability to adapt these practices to the newer concepts of digital data handling through computer use. Incumbent is responsible for developing and producing digital and hardcopy map products to meet the information needs of various resource specialists and teams. Duties include designing map compositions and using GIS software to symbolize, label, annotate, and display various themes and produce hardcopy output. Frequently, symbology must be customized to be consistent with national direction regarding resource mapping. Duties also include producing map layers for use in contract printing and coordinating with commercial printers and Regional Office personnel regarding printing specifications and processes.

- Spatial Analysis: GIS contains numerous data manipulation and analysis functions. The incumbent meets with Forest resource specialists and managers to determine the type of analysis desired and assess the suitability of the GIS to provide the appropriate analytical functions to accomplish the objective. Projects are designed mutually and involve defining information requirements, evaluating existing data and identifying data gaps, and specifying required map and data products. Incumbent is responsible for assembling data sets, selecting appropriate analysis functions and designing analysis models, and verifying with resource specialists that output products meet information needs. Frequently, projects will involve generating several alternatives, requiring that new data be collected or generated through an analytical process. Output materials may be used in an iterative process to identify new datasets needed and to assist in developing alternatives. Some projects may involve designing customized systems using GIS related programming tools and require long-term involvement by the incumbent.
Training & Awareness: Incumbent must keep current with GIS technology, staying abreast of technology changes. Incumbent will also evaluate programs and methods currently in use, study newer or more efficient programs and methods, and incorporate and promote useful new techniques. Duties may include supervision and training of seasonal or temporary employees.

FACTOR I - KNOWLEDGE REQUIRED BY THE POSITION:

Full working knowledge of GIS concepts and operations is critical to this position. Specifically, incumbent must be knowledgeable in the use of Environmental Systems Research Institute (ESRI) suite of GIS programs currently known as ArcGIS. A working knowledge of the Oracle database management system, the Infra database, and the ability to establish relationships between GIS spatial data and the Infra database is required. In general, a familiarity with the Forest Service IBM computer system and its various software and hardware components is essential.

The incumbent must have a thorough understanding of the concepts and processes involved in creating, editing, and maintaining GIS spatial data and associated databases, including spatial and attribute editing, and proper data backup and maintenance procedures.

Duties of the position require an understanding of advanced GIS techniques, such as dynamic segmentation and routing, overlay analysis, summary statistics, raster data processing, and Model Builder. Knowledge of some table functions in Excel Spreadsheets is essential to present analysis results to resource specialists.

Knowledge of cartographic production must encompass all phases of computerized digital mapping. This knowledge should be sufficient to provide the incumbent with skills in map manuscripting, map symbolization and annotation, and production of digital and hardcopy output. Each mapping project will have separate requirements for the display of information, and the incumbent must design each project to accomplish the display objectives. Knowledge sufficient to recognize and resolve issues such as missing, incomplete or erroneous data, through editing existing data or researching and locating other suitable data sources is required.

Incumbent must also be knowledgeable in natural resource management programs, issues and policies, and have familiarity with physical and natural sciences to assist and advise resource managers in choosing appropriate data sources, analysis functions and output products to fulfill information needs and answer complex resource questions. Incumbent should be able to effectively communicate with specialists in a variety of resource disciplines (i.e., timber, range, wildlife, etc.) and have a thorough understanding of the attributes of each resource or land management function represented in GIS.

The incumbent must be able to effectively train GIS users and present GIS procedures and products to forest employees and the general public.

FACTOR 2 - SUPERVISORY CONTROLS:

Incumbent is supervised by and works under the general direction of the Forest's GIS Program Manager, Land Management Planning branch.

The supervisor provides direction by setting overall goals and objectives based on Forest priorities and available resources. The supervisor delegates work assignments and sets deadlines; however, work assignment and scheduling is frequently delegated to the leader of the Interdisciplinary Team or teams to which the incumbent is assigned. Supervisor and employee meet regularly to discuss product deadlines and timeframes, and review assignments. Questions involving significant modifications of the direction or potentially controversial matters are resolved with the supervisor.

The incumbent exercises initiative regarding selection of techniques to accomplish assigned tasks. The incumbent plans and carries out the successive steps and handles problems and deviations in the work assignments based on
In the course of completing a project, the incumbent coordinates with various resource specialists and resolves technical problems which may arise. Completed work is reviewed by the requesting specialist for effectiveness in meeting their information needs.

**FACTOR 3 - GUIDELINES:**

Information is available regarding applicable guidelines, established practices, precedents, correction guides, map and data standards, and Forest Service direction. However, the technology is in constant change and the incumbent must continually review and stay current with changes in applications and guidelines. Incumbent may be required to work with new technology and applications for which only general or newly emerging guidelines are available. The incumbent is responsible for becoming aware of and adhering to established and new guidelines, standards, and direction. The technician must exercise judgment in applying current GIS and cartographic practices to new situations and in relating new work situations to precedent ones. In situations where guidance is conflicting or insufficient incumbent uses judgment to initiate discussions, perform literature searches, seek out needed guidelines, adapt existing guidelines, or modify approaches to improve work processes or quality of results.

**FACTOR 4 - COMPLEXITY:**

The incumbent must apply a practical knowledge of GIS to each mapping project in order to select the best methods to use, to establish the sequence of operations, to determine the time frames, and to subdivide the project into discrete and logical tasks. Work assignments may require researching new or innovative techniques to determine the most efficient course of action. The variety of data sources and the differing accuracies of data must be considered in relation to the final product needs.

Several projects in varying stages of completion will be undertaken concurrently.

Projects may extend beyond the Forest boundaries and involve other agencies with different management direction. Because of the contacts outside the Forest and the agency, there are occasions when the incumbent must interpret policy to insure compliance with regulations.

The resource issues underlying many of the projects are complex and involve many interrelated factors and many data and information sources. The incumbent must have an understanding of the resource issues pertinent to each of the disciplines involved in land management and be able to translate resource questions into information needs that can be addressed with GIS.

**FACTOR 5 - SCOPE AND EFFECT:**

Work efforts are an integral part of Forest management programs because of the need to use current resource information for data layer construction and because of the significant role the GIS will play in resource conservation decision making. The work requires a substantive knowledge of technical cartographic and analytical principles and practices and/or highly developed skills in the setup and operation of complex equipment. Work efforts affect the timeliness, accuracy, reliability, and acceptability of the map or chart product being produced, and thereby directly affects the resultant decisions made to accomplish the Forest Service mission.

**FACTOR 6 - PERSONAL CONTACTS:**

Personal contacts occur within the agency at all levels and in all functions. There are also contacts with individuals and groups outside the agency, such as other federal agencies, State agencies and private industry. Maintaining good networking skills with other peers in the field is an essential feature of this position.
FACTOR 7 - PURPOSE OF CONTACTS:

The purpose of contacts is to coordinate schedules and program work efforts and exchange information with people directly involved with GIS-related projects. Follow-up contacts are necessary to ensure that projects are proceeding as planned and that output products are meeting informational needs. Personal contacts also are frequently used to seek advice and resolve technical problems for which there may not be clearly identified precedents.

FACTOR 8 - PHYSICAL DEMANDS:

The work is primarily sedentary, typically involving long periods of sitting at computer terminals or drafting tables. Extended periods of computer terminal operation and video screen use can result in neck, wrist and eye strain.

FACTOR 9 - WORK ENVIRONMENT:

Work is usually carried out in an office setting where normal temperature, humidity, lighting, and noise levels are maintained.

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