SECRETARIA DE AGRICULTURA Y RECURSOS HIDRAULICOS
SUBSECRETARIA FORESTAL
DIRECCION GENERAL DE PROTECCION FORESTAL

XXIII REUNION DEL GRUPO DE ESTUDIO SOBRE MANEJO DE INCENDIOS FORESTALES

COMISION FORESTAL DE AMERICA DEL NORTE

DEL 9 AL 13 DE OCTUBRE DE 1989
CANCUN, QUINTANA ROO, MEX.

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1. DIRECTORIO

Canada

Mr.Dennis Dube	National Coordinator of Forest Fire Research Forestry Canada
Mr.Regis Proulx	Chef Du Service de la Protecction Contre le Feu - Province de Quebec
Mr.Brian Stocks	Head - Forest Fire Researh Forestry Canada Ontario Region
Mr.Bob Bailey	Director, Fire Operations Northwest Territories Chairperson, Canadian Committee on Forest Fire Management

Estados Unidos

L.A."Mic" Amicarrella	Director Fire y Aviation USDA Forest Service
Mr.Jack Wilson	Director - Boise Interagency Fire Center Logistic Support
Mr.Bill Baden	Wildland Fire Program Manager National Fire Protection Association
Mr.Jerry Monesmith	Branch Chief, Training Safety
Mr.Lee Barkow	Chief, Division of Fire And Aviation Management,Bureau of Land Management
Mr.Harry Layman	Chif, Nasf Fire Commite Director Division Forest Resources for North Carolina
Dr.William Sommers	Director,Forest Fire and Atmospheric Sciences Research USDA Forest Service
Mr.Paul Weeden	Defense Emergency Operation Specialist Forest Service, Washington DC

Mèxico

Ing.Higinio Padilla G.	Subdelegado Forestal S.A.R.H. Jalisco
Ing.J.Josè Reyes R.	Asesor del Subsecretario Forestal y Delegado Alterno COFAN (S.A.R.H.)
Ing.Roberto Martìnez D.	Subdirector de Protecciòn Forestal (S.A.R.H.)
Biol.Jesùs Sànchez C.	Jefe de la Red de Investigaciòn en Incendios INIFAP
Ing.Aaròn Mastache M.	Director de Protecciòn Restauraciòn Forestal (S.A.R.H.)

Otros Participantes:

GTF.Miguel Corona V.	Subjefe de Distrito Fomento y Protecciòn Forestal Distrito de Desarrollo Fural No. VII, Cd. Guzmàn,Jal. S.A.R.H. Mèxico
Ing.Orlando Alpuche O.	Jefe de Distrito de Desarrollo Rural No. 003, Cancùn,Q. Roo. Mèxico
Ing.Alberto Acevedo M.	Subdelegado Forestal. S.A.R.H. Q.Roo Mèexico
GTF.Jorge Lara Martìnez	Coordinador Forestal del Distrito de Desarrollo Rural No. 003, Cancùn Q. Roo. Mèxico

2. INTRODUCCION:

Reconociendo la importancia del conocimiento y desarrollo tecnológico producido por la investigación y por las exitosas políticas y prácticas del manejo del fuego realizadas por las naciones de Norteamérica, el **Grupo de Estudios de Manejo de Incendios Forestales de la Comisión Forestal de América del Norte**, ha resuelto incrementar la importancia de los programas de investigación de incendios forestales de México, Canadá y Estados Unidos de Norteamérica, a través de la mejoría de la cooperación trilateral entre los miembros de la COFAN, en el seno de nuevos y específicos esfuerzos de cooperación en investigación que se definan y designen en los años subsecuentes.

Estos esfuerzos de cooperación incluirán visitas de intercambio de científicos, participación en seminarios y en actividades que beneficiarán las metas multinacionales definidas en la Conferencia Internacional de Incendios Forestales de 1989 en Boston, Mass., E.U.A.

Las áreas técnicas con enfásis potencial consideradas, incluirán: Un Indice de Riesgo de Incendios Forestales combatible o los países, técnicas de predicción de incendios forestales, mejorar la tecnología de quemas prescritas y la mejor cuantificación de la emisión y transporte del humo de los incendios forestales.

3. REVISION Y DISCUSION DE LAS RECOMENDACIONES DE LA 22a. REUNION DEL GRUPO

Tema 1. Simbolos Internacionales para la Prevenciòn de Incencios Forestales:

Se entregaròn por parte de la Delegaciòn de E.U.A. (Jerry Monesmith) los simbolos impresos en papel adherible en diferentes tamaños

Tambièn fueron proporcionados los originales o "matrices" de los simbolos para que las otras Delegaciones puedan imprimir cualquier cantidad de simbolos en sus respectivos paises

Tema 2. La Publicaciòn de "Forest Fire News" :

Se determinò seguir apoyando la impresiòn de la revista que realiza Canadà, asi como la distribuciòn que ha efectuado E.U.A.

Serà necesario actualizar los domicilios de los participantes en el Grupo para asegurar el envio de la revista

Se estableciò el compromiso de enviar a Canadà, por parte de las Delegaciones de E.U.A. y Mèxico, una carta de apoyo a la publicaciòn de la revista

Tambièn se reiterò la necesidad de continuar con el envio de articulos de manera periòdica para reforzar el contenido de la revista en el futuro

Tema 3. Reconocimientos a la dedicaciòn en el Combate de Incendios Forestales:

Se sugiriò por parte de Paul Weeden la posibilidad de utilizar los certificados firmados en 1989, para reconocer la participaciòn del personal combatiente, en las cinco fronteras entre Canadà - E.U.A. y Mèxico - E.U.A.

La Delegaciòn de E.U.A. presentò certificados de reconocimiento en Inglès, Francès y Español, que fueron firmados por los representantes de las mismas, determinàndose que si el nùmero de certificados proporcionados a cada pais no era suficiente, se prodrian entregar y firmar un nùmero mayor

Se informò por parte de Mèxico, que los certificados firmados en 1988, se habian utilizado para reconocer la participaciòn del personal tècnico que apoyò el cómbate de los incendios forestales en el Norte de Quintana Roo en 1989

Tema 4. Coordinaciòn del Manejo de Incendios Forestales entre los paises, a travès de la capacitaciòn :

La Delegaciòn de E.U.A. entregò la lista de sus programas de capacitaciòn y adiestramiento para 1990. Canadà y Mèxico enviaràn sus programas con posterioridad

Tambièn se diò a conocer por parte de la Delegaciòn de Mèxico (Roberto Martinez Dominguez) y de E.U.A. (Paul Weeden), los trabajos preparatorios al "I Curso de Combate de Incendios Forestales en Quintana Roo", que se efectuarà del 15 al 25 de enero de 1990

Se sugirio por parte de E.U.A. (Paul Weeden) la conveniencia de tener brigadas de combate para incendios fronterizos, entre los paises miembros del grupo, tomando como base los convenios de ayuda mutua existentes

Con base en el convenio de Cooperaciòn fronteriza para la prevenciòn y el combate de incendios forestales entre Sonora-Mèxico y Arizona E.U.A., se propuso la formulaciòn de un convenio màs amplio, tanto geogràficamente como en actividades forestales

Tambièn se planteò elaborar una propuesta especifica para la firma de un convenio de apoyo, entre los tres paises, para incendios de grandes magnitudes y que podrà ser tratado en la Reuniòn de COFAN que se realizarà en febrero de 1990 en San Diego California, E.U.A.

Tema 5. Memorândum de Entendimiento entre Mèxico y Canadà

Se sugiriò, por parte de las Delegaciones de ambos paìses la conveniencia de incluir este punto como un tema a tratar en la Reuniòn de COFAN en febrero de 1990, en San Diego, Cal.,E.U.A., y tratar de conseguir financiamiento que respalde las actividades que se programen dentro de este Memorândum

Tema 6. Revisiòn del Memorândum de Entendimiento de 1985 entre Mèxico y E.U.A. :

De manera previa a la Reuniòn del Grupo de Estudio sobre Manejo de Incendios forestales, existiò una reuniòn entre Paul Weeden y Gilberto Galeote para revisar las actividades de 1989 y programar las de 1990, faltando sòlo su validaciòn por las autoridades de ambos paìses para su formalizaciòn

Tema 7. Reporte de la Politica de manejo de Fuego en E.U.A. :

La Delegaciòn de E.U.A. (Lee Barkow) proporcionò el reporte final de la Politica de Manejo de Incendios Forestales en E.U.A. del 5 de mayo de 1989, donde se establecen los cambios, ajustes y en su caso el reforzamiento de las politicas, que de manera general fueron comentadas por los asistentes a la Reuniòn.

Tema 8. Dìa o semana intermacional de la Prevenciòn de Incendios Forestales :

Se realizò un profundo anàlisis de las implicaciones de cambiar las fechas que en la actualidad se utilizan en los tres paìses ya que en principio era dificil proponer algo real adaptable a cada paìs

Tambièn se estableciò la necesidad de contar con finaciamiento especìfico por parte de la COFAN, para realizar actividades de prevenciòn en cada paìs para una misma fecha.

Se determinò respetar las fechas con los que actualmente se realizan los eventos preventivos en cada uno de los tres paises y se propusò que de manera independiente a èstas fechas, se realizaràn actividades preventivas en las fronteras comunes de los paises del Grupo.

Tema 9. Otras actividades del Grupo de Estudio de Manejo de Incendios Forestales :

La Delegaciòn de Canadà (Dennis Dube) llevò a cabo una revisiòn de los otros Grupos de Estudios pertenecientes a las Comisiones Forestales en otras regiones del mundo y a travès de la FAO para poder obtener informaciòn cada 2 años de las estadìsticas de incendios forestales, para lo cual realizarà un resumen y se darà a conocer a los miembros del Grupo en fecha pròxima.

Serà necesario establecer contacto formal con los Grupos de Estudio de otras regiones del mundo, a travès de las autoridades de la COFAN.

Se establecio que a excepciòn del Grupo de Estudio de Manejo de Incendios Forestales de la Comisiòn Forestal Europea, nuestro Grupo de Estudio (de la COFAN) ha sido el mas constante y con mayores resultados.

Tema 10. Glosario de Tèrminos :

Se reconociò que el glosario de tèrminos editado por FAO es el màs completo y apropiado por estar traducido al inglès, francès y espaÑol, pero serà necesario actualizar tèrminos y adicionar algunos otros.

El Grupo deberà ponerse en contancto con la NFPA para hacer la actualizaciòn del Glosario de FAO, ya que la NFPA participarà como organismo tècnico en su revisiòn.

El principal problema observado en el glosario de la FAO es la distribuciòn del mismo por lo que al mismo tiempo de su actualizaciòn debe buscarse las mejores maneras de distribuirlo y consultarlo (libro, diskete u otros).

Tema 11. Daños causados por el Huracán Gilberto :

Este tema fue atendido con la asistencia técnica proporcionada a México por la COFAN en enero de 1989, lo cual fue agradecido por la Delegación de México (Aarón Mastache).

Tema 12. Composición del Grupo de Estudio de Manejo de Incendios Forestales

En virtud de los cambios en los integrantes del Grupo por parte de la Delegación Mexicana, se dieron a conocer los nuevos integrantes del mismo. Las Delegaciones de Canadá y E.U.A. no registraron cambios en sus integrantes.

Tema 13. Ubicación de la siguiente Reunión del Grupo :

Este tema fue atendido con la 23a. Reunión en Cancún, Quintana Roo en 1989.

Tema 14. Participación en la Conferencia Internacional de Incendios Forestales, en Boston, Ma., E.U.A. :

Con la asistencia y participación de los tres países en la organización de la Conferencia, ésta tuvo un gran éxito, por lo que se determinó la necesidad de dar seguimiento y apoyo a las conclusiones y acuerdos que de ella resultaron.

Tema 15. Distribución de materiales del Grupo de Manejo de Incendios Forestales :

Este tema fue atendido por las Delegaciones de los tres países que intercambiaron material técnico en la materia.

4. ACUERDOS Y RECOMENDACIONES DE LA 23a. REUNION DEL GRUPO

Se determinò convenientemente e importante establecer a travès del documento denominado **"EL COMUNICADO DE CANCUN"**, la visiòn y posiciòn del Grupo de Estudios de Manejo del Fuego ante la COFAN para la atenciòn del problema de los incendios forestales en esta regiòn del mundo.

" EL COMUNICADO DE CANCUN "

Mèxico, Canadà y Estados Unidos como miembros consistentes del Grupo de Estudio de Manejo de Incendios Forestales de la Comisiòn Forestal de Amèrica del Norte y como principales patrocinadores de la Conferencia Internacional sobre Incendios Forestales que se efectuò en Boston, Massachusetts, en julio de 1989, continuaràn esforzandose para ser lideres en el manejo de incendios forestales.

Ademàs, està firmemente establecido y aceptado que el problema de los incendios forestales tiene implicaciones mundiales, influenciando en los cambios climàticos, por lo que es reconocido como un desastre natural mayor segùn la resoluciòn de las Naciones Unidas, que establece los 90'S como **" LA DECADA POR LA REDUCCION DE DESASTRES NATURALES ".**

Por tanto, con la presente aceptamos los retos y oportunidades identificados en la Conferencia Internacional sobre Incendios Forestales y resolvemos inmediatamente emprender las siguientes acciones:

A). Que la Conferencia Latinoamericana de Prevenciòn de Incendios Forestales sea organizada y se efectue en diciembre de 1993.

B). Que el Memoràndum de Entendimiento tripartito entre Mèxico, Canadà y E.U.A. sea desarrollado para facilitar la "movilizaciòn hemisfèrica" de recursos para el manejo de incendios forestales.

C). Apoyar a la Organizaciòn Mundial para la Agricultura y la Alimentaciòn (FAO) de las Naciones Unidas para mejorar, imprimir y distribuir el glosario de tèrminos en incendios forestales (publicaciòn No. 270).

D). Apoyar el desarrollo y ejecución de acuerdos locales y regionales para incrementar la cooperación y coordinación de los programas de manejo de incendios, entre los países miembros.

E). Continuar con la publicación "Forest Fire News" como vehículo efectivo para la comunicación internacional en la materia.

F). Incrementar la importancia de los programas de investigación de incendios forestales de las tres naciones, para beneficio en el cumplimiento de las metas multinacionales delineadas en la Conferencia Internacional sobre Incendios Forestales de Boston, Mass. E.U.A. en 1989.

5. INFORME GENERAL DE LOS PAISES MIEMBROS

Los informes de las actividades de manejo de incendios forestales de la temporada 1989 fueron presentados y comentados por los asistentes a la Reunión. Una copia del informe de cada país (Canadá, Estados Unidos de América y México) ha sido reproducido y se incluye en el presente informe en el Anexo 1.

También se presentó, por parte de Alberto Acevedo, un reporte completo de los incendios forestales ocurridos recientemente en el Norte de Quintana Roo, lo cual generó un gran interés entre los miembros del Grupo. En el Anexo 2 se incluye una copia de dicho informe.

ANEXO : 1

REPORTE DE LOS PAISES MIEMBROS

C A N A D A

R E P O R T

PREPARED
FOR

TWENTY-THIRD MEETING

FIRE MANAGEMENT STUDY GROUP

NORTH AMERICAN FORESTRY COMMISSION

OCTOBER 9-13, 1989

CANCUN, MEXICO

PREPARED BY:

Dennis Dube, Forestry Canada
Brian Stocks, Forestry Canad
Bob Bailey, Government Of Northwest Territories
Al Jefferey, Canadian Interagency Forest Fire Centre
Regis Proulx,Ministere De L'Energie Et des Ressources,Quebec

INTRODUCCION

a). NEW FORESTRY DEPARTMENT

With the creation of a new federal Department of forestry, the Canadian Forestry Service has been renamed Forestry Canada. Legislation estabilishing a full department is currently before the government as Bill C-29, and is expected to be passed before the end of 1989. As noted in last year's report to the NAFC - FMSG, the Minister of Forestry is the Honorable frank Oberle. The Minister of Forestry, under the pending legislation shall:

i) coordinate the development and implementation of forestry and forest resources policy, and of programs and practices established pursuant to that policy.

ii) assist the development of Canadian scientific and technological capabilities in forest management.

iii) promote the development and application of forest management codes and standards.

iv) have regard to the sustainable development of Canada's forest resources and the enhancement of the intermantional competitiveness of the Canadian forest sector.

v). promote cooperation, in relation to the three forest resources of Canada, with the governments of the provinces and with non-governmental organizations in Canada, and participate in the promotions of such cooperation with the governments of other three countries and with international organizations; and

vi). gather, compile, analyze, coordinate and disseminate information respecting scientific, technological, industrial, four managerial, marketing and related activities and developments affecting the forest resources of Canada.

b). National Fire Prevention Message

Forestry Canada, in an effort to remind Canadians about the danger of forest fires, produced a 30 second public service announcement for television called **"Carelesseness Consts".** The message emphasizes that 75% of the 10,00 fires that occur each year are attributable to human carelessness. In addition to the 200-300 million dollar cost o annual fire suppression, the public service announcemente identifies other costs, including jobs, revenue, recreational areas and sometimes lives.

FORESTRY CANADA FOREST FIRE RESEARCH PROGRESS 1988 - 1989

B.J. Stocks

Cooperation among fire past researchers in Forestry Canada (FC) continued during the year, as researchers from four FC estaablishments worked collectively to address priority problems. This approach to tackling major research issues has become common in recent years as shrinking resources, coupled with an increasing number of emerging issues, have forced a pooling of research talents.

The FC Fire Danger Working Group, in a series of working meetings, finalized development of the Canadian Forest Fire Behavior Prediction (FBP) System. The Fire Danger Group, consisting of FC fire researchers from the Pacific and Yukon, Ontario, and Northwest Regions as well as the Petawawa National Forestry Institute, is Hosting a technology transfer workshop in late 1989 of introduce this latest version of the FBP System to Canadian fire management agencies. In a related matter, FC fire researchers are meeting with their U.S. Forest Service (USFS) counterparts in late 1989 to plan cooperative fire behavior and fire danger research activities. The Fire Danger Group also hosted a meeting of client agencies to discuss the past, present and future of fire ocurrence prediction techniques in Canada.

The FC Prescribed Fire Working Group organized a workshop in conjunction with the Fire and Forest Meteorology Conference in Ottawa in April of 1989. Prescribed fire specialists from FC, the USFS, and a number of provincial agencies exchanged information on their research and operational activities. Membership in this working Group is expanding as interest in the use and impact of prescribed fire in Canada continues to increase.

The joint Canada/US cooperative investigation into the behavior and atmospheric environmental impact of large-scale, mass-ignition prescribed fires continued in 1989. FC and the USFS were the lead agencies, with the participation of the National Aeronautics and Space Administration (NASA), the US Defence Department, the Ontario Ministry of Natural Resources (OMNR), and the Ontario Ministry of the Environment (OMOE). Two large prescribed burns in northern Ontario were heavily instrumented and monitored in August. A somewhat similar, although less detailed study, concerned

primarily with smoke management prediction modelling, was undertaken on a prescribd burn in british Columbia in September.

Following is a summary of additionnal fire research activities within various FC research establishments in 1989.

- **Pacific and Yukon Region (Pacific Forestry Centre)**

The Fire Research Unit Head, B.D. Lawson, chaired the Northwest Fire Council, hosting the 1988 Annual Meeting and producing a published Proceedings, and also represented the Council at the Annual Meeting of the Western Forestry and Conservation Association.

Mr. Lawson completed his final year of membership on the Canadian Committee on Forest Fire Management (a National Research Council of Canada Associate Committee), reporting to the Annual meeting on his participation in the 1988 Fire Study Tour of Australia, and on research developments in the Canadian Forest Fire Danger Rating System (CFFDRS), on behalf of the FC Fire Danger Group.

As well, Mr. Lawson organized and conducted a one-week Fire Study Tour of Canada for a group of six Australians, following their three-week tour of the USA in August 1989. This was the eighth formal exchange involving the three conuntries since the study tours began in 1970. Discussions are underway to develop a theree-country agreement to continue the fire tours and to increase and broaden participation, particularly from Australian an Canadian operational fire management organizations.

Fire research activities at FC Pacific and Yukon Region continued to centre on completion of the Canadian FBP System, evaluation of moisture conten models for slash wood, and prescribed fire uses in silviculture. Mr. Lawson attended two working meetings of the FC Fire Danger Group, and presented a symposium paper on the results of field testing a medium slash moisture model for British Columbia fuel types. A training session on the CFFDRS was presented at a provincial fire managemente training course. On the prescribed fire research side, the final year of the five-year study into the use of fire in backlog site rehabilitation commenced, with plantation results on the various experimental site treatments currently being analyzed. As well, Pacific and Yukon Region fire

researchers continue to coopertate in the Canada/US cooperative mass fire behavior and impaet study, whit research center around the mass balance model components of energy release rates, studied on two large prescribed fires in northern Ontario in August 1989. The province of British Columbia has begun a somewhat similar study, oriented primarily to smoke management prediction modelling, and Pacific and Yukon Region fire researchers are providing research cooperation and information links between the two studies.

B.C. Hawkes, prescribed fire specialist within the Fire Research Unit, has begun educational leave for two years to work on a PhD in prescribed fire impact modelling at the University of Montana. During his studies, he will work on prescribed fire impact data collected from many operational an research prescribed burns oraund British Columbia, attempting to produce improved predictive models for fire managers.

- **Northwest Region (Northern Forestry Centre)**

The Intelligent Fire Management Information System (IFMIS), developed by B.S. Lee, was unveiled for the 1989 fire season. IFMIS is a microcomputer-based system for presuppression planning and initial attack dispatching, which integrates many types of forest fire management data bases and uses a number of advanced technologies. IFMSIS was installed at three locations in Alberta and one location in Saskatchewan where it was used throughout the 1989 fire season. The general impression is that IFMIS has proved effective for use in prepositioning suppression resources and for initial attack dispatching. A study of the effectiveness of IFMIS has been initiated.

Under the direction of M.E. Alexander, four successful experimental fires were carried out in the joint FC/Alberta Forest Service burning project in the black spruce-Labrador tea-Cladonia fuel complex in northern Alberta. Mr. Alexander also participated actively in the FC Fire Danger Group developing the Canadian FBP System, and departed in August for two years of development leave in Australia where he will study plantation fire behavior.

C.J. Ogilvie continued his research activities on fire foams and infrared technology. A computer with video digitizing board and custom software for image analysis, and a video downlink system were purchased for inclusion in the Aerial/Infrared Data Management and Analysis System (AIDMAS). AIDMAS was used with success on a Manitoba wildfire, and two large presbribed fires in Ontario (as part of the cooperative Canada/ US mass fire study). As well, an field evaluation of fire foams was initiated, as

a result of recommendations from a Northwest Region Fire Foam Workshop. This evaluation used infrared and ground sampling and was a cooperative venture with the governments of Alberta, Saskatchewan, and the Northwest Territories.

Z. Chrosciewcz, nearing retirement, continued his analysis and publication of accumulated data on the silvicultural aspects of prescribed fire.

Tow FC fire specialists, W.J. DeGroot and K. G. Hirsch, assigned to Northern Region satellite offices in Saskatchewan and Manitoba respectively, were seconded to the provincial fire management agencies in each location. A Fire Suppresion Preparedness System for Saskatchewan was completed and implemented in the 1989 fire season, and a review the severe 1989 fire season in Manitoba was initiated. A series of technology transfer sessions on the CFFDRS and other fire management issues were arranged for both provinces, and DeGroot and Hirsch provided fire behavior officer expertise during the 1989 fire season.

- **Petawawa National Forestry Institute (PNFI)**

C.E. Van Wagner, retired but working on a part-time basis, has been primarily concerned with the final design and integration of equations and programs for the Canadian FBP System. He continues to be an active member of the Fc Fire Danger Group, and shares his expertise locally, nationally, and internationally through symposium papers and invited lectures.

Project leader M.G. Weber continued his coopetative research with staff from the FC Pacific and Yukon Region, near Prince George, B.C. A poorly regenerated backlog site was treated sepatately with prescribed fire, herbicide, a disk trencher, and combinations thereof using a complete randomized block design. This installation was then planted to white spruce and lodgepole pine. Two sets of destructive seedling samples have been taken representing first and second year growth, respectively on the various site treatments. Chemical analysis of plant tissues and substrate are partially completed allowing eventual evaluation of seedling nutrient use efficiency by species and in relation to treatments applied. Mr. Weber presented a paper on the role of fire in red pine ecosystems at the 3rd International Fire Ecology Conference in West Germany. Research into aspen suckering after cutting and burning sparked interest on the part of provincial and Parks Canada agencies. The Manitoba Department of Natural Resources used the burning prescriptions developed at PNFI to improve elk habitat, and preliminary results appear successful.

M.D. Flannigan served as cochairman of the tenth Conference on Fire and Forest Meteorology, held for the first time in Canada in April of 1989. Mr. Flannigan also produced publications addressing such problems as the interpolation of fire danger between stations in Ontario, the development of fire whirls during prescribed burn operations, an evaluation of relative humidity measuremente methods and instruments, and a study of the weather patterns associated with a large blowdown event in northwestern Ontario. His ongoing work includes a study of the effect of anticipated greenhouse warming on wildfire severity in Canada (with C.E. Van Wagenr), the relation of lightning occurrence to wildfires in Ontario and a collaborative effort (with K.G. Hirsch) describing fire weather and fire behavior during the severe 1989 fire season in Manitoba.

R.S. McAlpine moved to PNFI from the FC Northewest Region in 1989, and has been involved primarily in fire danger research. He is a member of the Fc Fire danger Group and has been actively involved in the production of the Canadian FBS System.

- **Ontario Region (Great Lakes forestry Centre)**

Great Lakes Forestry Centre (GLFC) is the lead FC establishment coordinating the cooperative Canada/US investigation into the behavior and atmospheric environmental impact of large-scale, mass-ignition prescribed fires. Fire Research Unit Head, B.J. Stocks, with assistance from D.J. McRae and T.J. Lynham, spent much time organizing and coordinating this operation in 1989. Following two years of equipment evaluation on four Ontario prescribed burns (1987-1988), this study was expended greatly in 1989. Two large fires in northern Ontario were Heavily instrumented this year, resulting in the successful collection of a large amount of fire dynamics, column dynamics, and smoke chemistry data. Extensive ground-based sampling complemented measurements taken by numerous aircraft and helicopters. Cooperatin agencies., in addition to the FC establishments (Ontario, Pacific, and Northwest Regions), included the USFS, OMNR, OMOE NASA, and the US Defence Dept. Data is presently being analyzed and a detailed report will be produced early in 1989. Further cooperative work is planned for 1990.

FC Ontario Region fire researchers (B.J. Stocks and T.J. Lynham) on the FC Fire Danger Group continued to participate in the development of the Canadian FBP System which will be published and in use throughout Canada for the 1990 fire season. The FC Fire Danger Group collectively produced an overview article on the CFFDRS

which was published in the Forestry Chronicle in 1989. Mr. Lynham organized a working session of fire managers from across Canada to discuss the various fire occurrence prediction schemes in use throughout the country, and possibility of producing a national system.

D.J.McRae, in addition to being heavily involved in the cooperative Canada/US mass fire study, has produced reports on the development of large vortices on prescribed burns, on the behavior of point-source ignition fires in jack pine slash, and on fire acceleration on large-scale prescribed fires. He continues to work closely with the OMNR, participating in numerous trining seminars on prescribed burning.

T.J.Lynham has been actively involved in the analysis and publication of much of the fire ecology/history data collected at GLFC in the 1970's producing reports on the fire history of Sachigo Hills, and on vegetation recovery following fire in mature and immature jack pine.

In cooperation with a fire researcher from northern China, Mr. Stocks and Mr. Lynham published reports on fire weather/fire behavior on the Great China fire of 1987, and on the suitability of the CFFDRS for use in northen China.

Under a COFRDA (Canada Ontario Forest Resource Development Agreement) contract GLFC fire researchers are producing a photo-series/fuel inventory handbook for Ontario forest types, which will be published in early 1990.

Recent Forestry Canada Fire Research Publications

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Canadian committee on Forest Fire Management

Report To

North American Foresty Commission

Fire Management Study Group

R.P. Bailey
Chairperson
October, 1989

Introduction

The Canadian Committee on Forest Fire Management (CCFFM) is an associate committee of Canada's National Research Council. CCFFM was established in 1952 to serve as a national advisory body for the advancement of research into forest fire problems and for the development of improved fire management practices and interagency cooperation in Canada.

Membership of the Committee reflects the broad base of interest in forest fire research in Canada. Federal, Provincial, Territorial and private operating fire management agencies, federal research agencies, universities, technical schools and forest industry are all represented to ensure the best possible advice on needed forest fire research is developed and provided to Canada's National Research Council.

Activities Since October 1988

The Committee has spent a considerable amount of time giving consideration to the role the Committee is to play in the fire research community in Canada. Previously the Committee had worked on some subjects that were more of an operational concern such as trainin and resouce exchanges. This type of work more properly belongs to the Canadian Interagency forest Fire Centre an operational group. The Committee has decided to focus its attention more clearly in the fire research and development area by providing advice to research bodies such as teh National Reseaarch Council, Rorestry Canada and universities.

The sub-Committee on forest Fire Research prepared a report for the Committe outlinig how the Committee can accomplish this new focus. The report was fully acepted by the Committee and the Executive was directed to implement the appropriate changes

One major change is the abolishment of the sub-Committee on Forest Fire research. An expanded Executive is to undertake that role. The Executive would then consist of 6 members, including, Forestry Canada's National Fire Research Coordinator and the Executive Secretary.

Another Change is that small task groups of one or two persons would be created by the Executive as the need arose to examine a variety of items such as research themes and project proposals. Each task grop would report to the Executive and full membership at each annual meeting.

Four task groups have been created to date. One was formed to develop a display sistem advertising the existence of the Committee. The display system would be used at different fire related functions each year. Another group was formed to attend a Forestry canada sponsored. Fire Prediction Working Group meeting. The task group is to report back on the state of fire prediction in Canada and the direction Forestry Canada is working on in this important research area. A third group is working with another associate committee to prepare for the Associate Committee on Agriculture and Forestry Aviation conference to De held in Winnipeg, Canada in October, 1990.

The fourth group, the Canadian Interagency foresr Fire Centre (Allan Jeffrey), has taken on the task of updating and editing the Canadian Directory of Forest Fire Management Personnel annually.

Several other task group are to be formed shortly.

The equipmentd Sub-Committee received full support for its recent work at the annual meeting. Executive member Wayne Clowater had been given the task of working with the Equipment Sub-Committee Chairman to develop work plans and ensure the Equipment Sub-Committee has access to and support of the Executive.

The work plans for this Sub-Committee received full support and as a result of one of the work plan items joint meetings with the Fire Equipment Working Team of the U.S. National Wildfire Coordinating Group have been formalized on a bi-annual basis. This formulation strengthens contact between the two groups and ultimately between the two countries. A joint meeting is scheduled at San Dimas, California, October 16 to 20, 1989.

Teh use of foam suppressants has been an issue of concern to many members. The Equpment Sub-Committee has been directed to concentrate its efforts on related hardware, delivery systems and sefety only. It is expected that Forestry Canada would study foam composites and standards.

The Committee at the annual meeting passed the following resolution:

Cerificate of Merit

Whereas a number of individuals have provided long and meritorious service and:

Whereas a number of indiviudals have contributed significantly to forest fire research and management; and

Whereas some individuals have given of life and limb in the fulfilling of these duties; and

Whereas the North American Forestry Commission have provided a forum for recognizing such individuals. Therefore:

Be it resolved that members of the Fire Management Study Group, Through the Executive of the CCFFM recognize up to five individuals annually by bestowing on them an appropriate certificate of merit.

As a result of this resolution Canada now has a formal national method of providing names of appropriate Canadians individuals to the North American Forestry Commission to recognize contributions and service to the Canadian fire community.

Summary

The Canadian Committee on Forest Fire Management has recognized that its role within Canad's fire community has changed with the introduction of the Canadian Interagency Forest Fire Center. The Committee views the creation of the Interagency Centre in a very positive way and Committee Members did play a significant role in its development.

Now the Committee will re-direct some of its efforts previously devoted to more operational roles towards research and development areas aimed at reducing significant losses to wildfire in Canada.

1989

C A N A D A

FOREST FIRE

OPERATIONS REPORT

Central Saskatchewan and Manitoba came into the fire season with well below average moisture levels as a result of a continuing drough, below normal snow levels, and no appreciable spring rains. High Drought Code start up values were also reported in the Northwest Territories and parts of south central British Columbia.

On May 11, both Saskatchewan and Manitoba had multiple man caused fire starts with extreme fire weather indices which resulted in a number of fires escaping initial attack. Air tankers and fireline equipment was mobilized to meet the demand.

Manitoba continued to experience multiple man caused fire starts over the next few days, adding to their escaped fire problems The Interlake area was the hardes hit where large hectareaes Were lost along with many structures and livestock. Extra airtankers, fireline equipment and ground crews were moved in to assist. By the end of May the situation had stabilized in Manitoba and throughout Canada.

British Columbia experienced multiple fire starts during the first week of June, necessitating the importation of two United States 20-man category I unit crews to assist in an escaped fire near Golden, British Columbia. These Crews were specialized in mountain fire fighting techniques.

While the fire hazard during most of June remained generally high to extreme in many areas of Canada, the fire occurrence stayed relatively low. Approximately 2,000 less fires were reported by the end of June than were looged for the same period in 1988. July, on the other hand, was an extremely active fire month with the total fire numbers surpassing 1988's number by 1,000 fires at the end of the month.

The fire hazard continued to escalate during the first week of July until July 10 when the Yukon started to receive multiple laghtning starts. This situation continued through the next y days resulting in a few fires escaping their

stretched initial atack resources. A Fire Project team was mobilized through the Alaska/ Yukon Border Agreement to manage a large fire on the Yukon side near Dawson. Additional Alaskan smokejumpers were moved through the Canada/United States Arrangement, in addition to the British Columbia resources already mobilized to assist the Yukon.

Dry lightning storms over the weekend of July 15 - 16 resulted in 287 new starts being recorded nationally on Monday July 17 Medium R/W supply immediately dried up, and light R/W were in imited supply. Requests for additional airtanker support, primarily CL-215, could not be met. Multiples starts continued throughout July in most agencies which resulted in as many as seven agencies on the board at once as recipient of resources from Member agencies.

Mainitoba sustained the worst losses during this period with daily multiple starts occurring in the northern half of the province. This resulted in numerous escape fires and subesquently the highest hectarege losses in Manitoba's history. Resources were mobilized, to assit Manitoba, from almost every Canadian fire agency along with 4 -206's R/W from the military, an experimental FLIR unit with operator from the FORESTRY CANADA pump kits and hose and high level infrared from BIFC

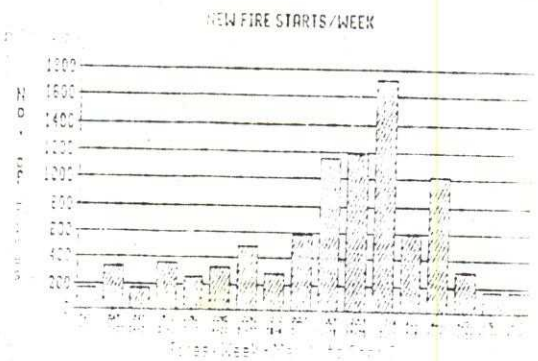
Almost all of the northern communities of Manitoba were affected in one way or another. Approximately 20,000 people were evacuated in advance of the spreading fire problem. The Government of Manitoba declared a "State of emergency" to allow the Emergency Measures organization more power to do what needed to be done.

Throughout July the competition for available R/W and airtankers reamained high. As these resources became available they were quickly moved into other agencies. At the end of July the availability of pumps and hose reached a critical level. Both the United States and Canada were heavily committed in fire action. One order for 100 pump units to BIFC resulted in only 50 units being sent. The situation intensified in the United States during later July and early August necessitating the early recall of the high level infrared and later they requested the pump units be flown back rather than trucked back to meet therir incrasing demand.

British columbia moved into August with a flurry of fire activity averaging over a hundred fires being reported daily. To assist British Columbia's Initial attack forces, crews were mobilized from Alberta and contract R/W from the Northwest Territories.

The Northwest Territories followed this activity with multiple fire starts occurring, which required them to recall most of their resources out on loan, plus request additional airtankers and manpower to augment their own stretched resourses.

Activity throughout the middle of August remained fairly high with many resources committed to sustained action fires while available resources continued to be moved to areas of potential need.



The following graph depicts the weekly fire starts from May to September 1989.

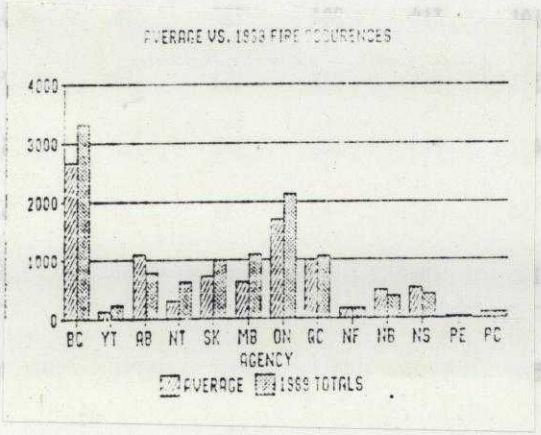
By the middle of September, we had surpassed the 1987 record of 11,291 fires with the new record of 11,339 fires as of September 15, (Table I) with a corresponding record of 6.5M hectares, ksurpassing the 1981 record of 5.4M hectares lost. (Table II).

This record level of fire activity resulted in 103 resource orders being processed through CIFFC this year. Along with the national movement of airtanker groups, and fireline equipment, came an increased call for human resources. In Canada alone, this year we moved approximately 300 personnel ranging from initial attack crews, to specialty infrared operators, to overhead teams and air attack personnel. Personnel from the United States, through the Canada/United States Arrangement, were also brought into Canada, two 20-man crews for British Colombia, 20 smokedumpers for the Yukon and the high level infrared scanner with crew for Ontario and Manitoba. The Yukon also through their Border Agreement with Alaska, had the Alaskans totally manage a large wildfire on the Yukon side near Dawson. Approximately 100 United States personnel, along with their own equipment and air support, were on that fire at one time.

An interesting development occurred during the 1989 fire season with the sharing of resources. Some agencies shared the resources they had, then they short term contracted resources, which better fulfilled their current fire requirements. An example of this is the Northwest Territories loaned their CL-215 group to Manitoba the picked up a DC6 land based group which better suited the fires occurring up and down the MacKenzie Valley

1989 FIRE SEASON

	FIRES			HECTARAGE		
	FAZ	OBZ	TOTAL	FAZ	OBZ	TOTAL
BC	3,338		3,338	21,230		21,230
YT	171	67	238	67,500	175,851	243,351
AB	769		769	6,744		6,744
NT	292	308	600	120,308	338,586	458,894
SK	793	210	1,003	202,171	289,407	491,578
MB	1,113		1,113	2,669,200		2,669,200
ON	1,861	283	2,144	9,272	392,066	401,338
QC	986	84	1,080	6,389	2,102,907	2,109,296
NF	179		179	59,910		59,910
NB	361		361	314		314
NS	390		390	404		404
PE	17		17	120		120
PC	102	5	107	737	1,677	2,414
TOT	10,372	967	11,339	3,164,299	3,300,494	6,464,793



As the Table above shows we exceeded both old records for fire numbers and hectares consumed. It is also interesting to note that over half the hectarege lost occur in the Observation Zone. In fact 8.5% of the total fires accounted for 51% of the total hectares lost. This shows a direct benefit to preparedness planning and aggressive initial attack.

The graph on the left shows the fire occurrence as compared to the ten-year avarage.

There were no fire related fatalities reported to date in 1989 compared to 3 in 1988, 3 in 1987, 6 in 1986 and 9 in 1985. This is a credit to the emphasis placed on safety.

WILDFIRE STARTS

TABLE I

TOTAL NUMBER OF FIRES (LIGHTINING AND MAN CAUSED)

PROV	1979	1988	1981	1982	1983	1984	1985	1986	1987	1988	AVERAGE	1989
BC	3849	1740	2737	2205	1784	3063	3604	2194	3473	1951	2652	3338
YT	65	150	91	204	198	168	110	217	125	115	144.3	238
AB	998	1353	1556	1272	755	1370	934	581	1236	865	1091.2	769
NT	388	345	311	357	337	311	150	206	374	198	296.1	600
SK	413	742	965	487	437	895	520	493	970	1864	698.6	1003
MB	644	1082	662	425	535	692	346	217	523	982	618.8	1113
ON	1564	1773	1656	1396	2244	1240	887	1088	1923	3268	1703.6	2144
QC	615	861	1114	1202	1652	683	880	830	992	1331	1016	1080
NF	191	60	131	165	168	101	310	204	287	116	173.3	179
NB	489	389	275	279	252	393	851	588	653	438	452.7	361
NS	682	439	449	491	332	451	583	508	590	328	485.3	390
PE	0	0	40	53	55	38	52	95	52	21	40.6	17
PC	40	103	148	104	93	161	128	90	93	73	103.3	107
TOT	9842	9042	10135	8640	8762	9566	9355	7311	11291	10734	9467.8	11339

TOTAL AS OF SEPT. 15 1989

FAZ FIRE NUMBER - 10,372

OBZ FIRE NUMBER - 967

TOTAL - 11,339

TOTAL AREA BURNED IN HECTARES (TEN YEAR AVERAGE)

PROV	1979	1988	1981	1982	1983	1984	1985	1986	1987	1988	AVERAGE	1989
BC	29307	65559	106598	348695	67363	19908	234647	17261	36177	11462	93694.7	21230
YT	7348	130781	35158	254891	43006	19895	15131	90568	88326	6310	69141.4	243351
AB	160182	632308	1308165	675674	2823	80731	12840	2280	36248	14051	292230.2	6744
NT	1989133	1214396	984932	302150	226841	41074	284745	321710	399076	66080	575013.7	458894
SK	225702	1325782	1647972	6060	52172	321235	110128	13159	226558	76689	400537.7	491578
MB	90460	603334	421000	14777	99153	130011	6306	10314	214163	470406	205992.4	2669200
ON	62976	550544	177389	3847	443655	120424	1007	146561	75582	390796	197278.3	481338
QC	3199	13176	2480	7970	242222	3081	2679	167551	36836	275620	75481.4	2109296
NF	39076	954	13087	4392	16792	7743	159744	108831	17128	1780	36952.7	59910
NB	1486	2815	419	6198	1673	645	2593	39103	1199	1975	5882.6	814
NS	755	979	370	617	448	594	10077	816	564	335	655.5	485
PE	N/A	N/A	146	131	321	202	181	512	113	17	162.3	120
PC	70762	275002	680173	9113	5210	14207	5646	2663	140	331	106324.7	2414
TOT	2680308	4815638	5379859	1634515	1201679	759750	756724	921329	1132110	1315772	2059267.6	6464784

TOTAL AS OF SEPT 15 1989

FAZ HECTARAGE - 3164299 HA.

OBZ HECTARAGE - 3300494 HA

TOTAL 6464794 HA

DECADE FOR NATURAL DISASTER REDUCTION

Two years ago the United Nations passed a Resolution establishing the 1990's as a Decade for Natural Disaster Reduction (DNDR) with a call for a concerted effort to reduce the loss of life and property from natural disasters. Wildfire was included as one of the disasters to be considered. The United States Congress intern passed a resolution supporting the Decade and asked the Administration to organize a United States effort.

In response, an Interagency Committee for the DNDR has been formed. Al West was appointed to represent the Department of Agriculture with Bob Gale serving as his alternate. The Interagency Committee has been working for the past year on developing a Federal program response and the means for coordinating Federal participation in this important National and International event.

The National Academy of Sciences has formed a National Committee of State and private sector experts to recommend program initiatives. Former Forest Service Chief Max Peterson is a member. Exofficio members of the National Committee include Alan Devenport of Canada and Emilio Rosenblueth of Mexico. The fire community is also represented internationally by Phil Chenny of the Australian Brushland Institute. Phil is a member of the United Nations Committee of experts.

The following four objectives have tentatively been identified. First, mount a campaing to create an awareness of the impact of natural hazards and the potential to significatly reduce thir risk; second, emphasize disaster prevention and preparedness; third, stimulate and share expertise, technology and insight with others at home and abroad; and four, aggressively develop and apply research results to reduce losses.

The Decade presents a unique opportunity to reduce natural hazards at home and abroad through an intensified effort composed of increased awareness, cooperation, and application of knowledge. It also is an opportunity for the fire community to join forces with the disaster community at large and capitalize on this major national and international effort. In pursuit of a set of common goals, we can increase our available resources for seeking solutions to fire problems such as the wildland/urban interface, arson, and major fire disasters.

international effort. In pursuit of a set of common goals, we can increase our available resources for seeking solutions to fire problems such as the wildland/urban interface, arson, and major fire disasters.

INTERNATIONAL FIRE MANAGEMENT ACTIVITIES.

Cooperation with Sonora.

On July 17 and 18, representatives of the Secretaria de Agricultura y Recursos Hidraulicos (SARH) from the Mexican States of Sonora and Baja California Norte and the Forest Service met in Phoenix, Arizona to review the fire suppression agreement between the Coronado National Forest and Sonora. All representatives felt that the current fire suppression agreement is very successful and that it is in our mutual interest to expand the current cooperative program of work. The representatives are currently working on an expanded agreement which will allow each agency to:

A. Initiate immediate and appropriate wildland fire suppression action against any fire within a mile of the International Border which threatens life, property or natural resources of the other country. This would apply to all the border lands along the entire international boundary between the Mexican State of Sonora and the State of Arizona.

B. Take immediate action to protect life during a wildland fire emergency. (An example would be the evacuation of firesfighters entrapped by a wildfire.)

C. Provide technical assistance on wildland fires which are not within a mile of the international border.

In addition to the fire suppression agreement, all representatives agreed to develop a separate agreement and undertake a cooperative plan of work for other forest resource management programs including timber, range, wildlife, recreation, etc. Additionally, all representatives agreed that we should work together and develop similar agreements to augment cooperation between the Mexican and American States.

Technical Assistance to Quintana Roo, October 1988

In September 1988 Hurricane Gilbert crossed the Mexican State of Quintana Roo on the Yucatan Peninsula, defoliating

fires, their size, and the impacts of the fires on the affected area. The process enabled La Secretaria de Agricultura y Recursos Hidraulicos to make decisions regarding implementation of alternatives identified in fuels management plans, fire prevention plans, presuppression plans, and suppression plans.

North American Forestry Commission Assistance to Quintana Roo, November, 1988.

On September 14, 1988, a day after wrecking Jamaica, Hurricane Gilbert blasted the northern coast of the Yucatan Peninsula of Mexico with winds that approached 200 miles per hour, damaging more than two million acres of rain forest. The Mexican State of Quintana Roo was particularly hard hit. It was the first Category 5 hurricane to make landfall in the western hemisphere since Cammille in 1969. Mexico requested assistance from the United States and Canada, her partners in the North American Forestry Commission, in assessing damage to the forest and in seeking steps that might be taken to avert a catastrophic fire risk in the upcoming dry season. Eight days (1/18-1/27) were spent inspecting forest damage, from the ground and air, and in discussion with resource officials.

Quintana Roo Fires, July 1989.

On July 12 the Mexican Goverment requested emergency assistance with large fires burning in the Hurricane Gilbert blowdown near Cancun in the State of Quintana Roo. Two Forest Service employees, John Swanson, California, and Roberto Rodriguez, Oregon, conducted a technical assessment of the situation and assisted local officials in developing strategy and control tactics. Major progress in controlling the wildfires and organizing the suppression and support effort was reported when the graduates of the previous international fire suppression courses were mobilized and deployed to Quintana Roo.

Fire Training, Quintana Roo, 1990.

The Forest Service and the Normatividad Forestal held a steering committee meetng during the week of October 2 to plan, develop, and organize a basic and intermediate fire suppression course for the fire crews of Quintana Roo. The course will be taught in January.

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Baja California Norte, July 1989

On July 6 the Mexican Government requested emergency assistance through the American Embassy in Mexico City because a large wildfire, located about 85 km southwest of Mexicali in the San Pedro Martires Forest in Baja California Norte, was burning out of control, threatening people, an astronomical observatory, an ecologically important wooded area and had entrapped eight firefighters. (Later it was learned that the eight firefighters were led to safety on July 6.) The Office of U.S. Foreign Disaster Assistance asked the USDA Forest Service to provide a technical assessment of the situation and provide emergency assistance. The Forest Service assisted in developing suppression and control tactics and in coordinating available Mexican fire suppression and logistical support resources within Baja California Norte.

Fire Program Evaluation, Federal District of Mexico.

Jim Hickman, Director, Aviation and Fire Management, Southwestern Region, and Albert Martinez, District Fire Management Officer, Canjilon Ranger District, Carson National forest assessed the forest fire management program of the southern part of the Federal District of Mexico and provided recommendations for possible improvement. Specific objectives included:

A). Assessing the fire manageament operation, including prevention, detection, suppression, dispatching and safety; suggesting alternatives and making recommendations.

B). Providing guidelines to develop a forest fire protection plan.

Jim Hickman and Albert Martinez noted major changes and improvements in the SARH fire suppression organization since the SARH personnel attended the international fire suppression courses held at Marana, Arizona in 1983 and

fluctuate with the weather and fire danger, but the acreage burned per fire is steadily decreasing. Mexico's SARH has the professional personnel with the enthusiasm, skills, and aggressiveness necessary to do the job.

Wildfire Training in Costa Rica

Gary Benavidez, Cibola National Forest, New Mexico, served as an advisor and instructor at the 1st National Interagency Wildland Fire Suppression training course in Costa Rica during the first tow weeks in December. The course was organized by Luisa Alfaro, training officer for the National Park Service in Costa Rica. Luisa had also served as a Steering Committee member and instructor at the 4th Wildfire Suppression Course in Mexico City. Working with Luisa as instructors in conducting this course were several graduates of the International Fire Supression Course held in Mexico in January-February 1988. The Boise Interagency Fire Center sent some tools and firefighting supplies that were used by students during the course.

Fifth Latin America Wildefire Suppression Course.

Paul Weeden, Forest Service, Washington, D.C., and Jay Perkins, Forest Service, Pacific Southwest Region, attended the Steering Committee meeting for the 5th Latin America Wildfire Suppression Course in mid-November in Madrid, Spain at the headquarters of the Instituto para la Conservacion de la Naturaleza. The meeting was hosted by Ricardo Velez, Director of Fire Management. The course is an advanced one and is intended for graduates of the four previous Latin America courses. Spain will cover the majority of the funding for this course, including the travel and per diem for about 20 participants from Latin America to attend the course when it is offered in October, 1990. The Steering Committee developed the course agenda and budget, selected instructors, and inspected the new training facilities north of Madrid.

Israel

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Our cooperative fire management program with Israel continues to expand. During 1989 Mic Amicarella, Bill Sommers and Mike Edrington visited Israel and helped them develop long term fire research, suppression and prescribed fire goals. During October, 5 Israeli management specialists will spend 8 weeks in the United States learning about prescribed fire, fire and its role in integrated resource management, and advanced fire management concepts.

By September 1, 1989, 44,755 wildfires and 1,691,963 acres burned had been reported to the National Interagency Fire Coordination Center at Boise, Idaho. A total of 1,127 crews, including military crews, had been mobilized nationally through the National Interagency Fire Coordination Center.

WEATHER INFORMATION MANAGEMENT SYSTEM (WIMS)

The WIMS project will result in a new weather data collection, processing and delivery system that will replace the current Administrative and Forest Fire Information Retrieval and Management System (AFFIRMS), and also accommodate the use of weather data by a broader spectrum of the natural resource community. The Analytical Sciences Corporation (TASC) has completed the first contract that included a weather information needs assessment and an array of conceptual system designs. The Forest Service selected the Centralized Facility Architectural Design and TASC then developed the system design specifications.

The solicitation package for the second phase of the project has been prepared and distributed to prospective contractors. This phase will produce the necessary software development, testing and user training necessary to implement WIMS. This contract will be awarded in October 1989 with a completion date of December 1991.

The goal is to implement a fully operational WIMS by January 1992.

PRESCRIBED MANAGEMENT CRITERIA TASK FORCE.

In September 1988 the Forest Service's Washington Office chartered a Task Force to review policy, direction, guidance, criteria, and processes used in managing prescribed fire programs, particularly prescribed natural

Forest levels. The Task Force consisted of eight members representing a cross-section of wilderness and fire managers with a broad perspective of the Forest Service, both organizationally and geographically.

The Task Force developed the Prescribed fire Management Task Force Report, which included 16 recommendations directed at improving shortcomings in current direction and procedures. The 16 recommendations were accepted by the Chief's office and the appropriate forest Service Manual sections were revised to provide new direction to the field in planning, implementing and managing prescribed natural fire programs.

FIRE MANAGEMENT POLICY REVIEW.

The final report was issued May 5, 1989. Reference the report handout for details.

Activity in June continued in the Southeast and in the Southwest. Severe drought conditions and lightning activity continued, contributing to one of the worst fire seasons that the Southwest had experienced in recent years. Three Type I Incident Management Teams were committed internally during the month in the Southwest, and 18 crews, 32 smokejumpers, and 223 overhead personnel were mobilized from other geographic areas. Fire activity continued in the Southeast much later than normal. Ten crews and 36 overhead personnel from other geographic areas were sent in support of the fires. Fire activity spread into Southern California and five crews were mobilized from outside the state in support of this activity. The Great Basin, Rocky Mountains and Nevada saw an increase in fire activity as a result of lightning activity.

July brought a significant increase in activity. The Southwest experienced record breaking temperatures with significant lightning activity. Late in the month an intense lightning storm started fires in California, Eastern Oregon and Idaho. In addition to local resources, 627 crews, 251 smokejumpers and 2,456 overhead personnel were mobilized from throughout the U.S. to fires in Montana, Idaho, Nevada, Utah, Oregon, Washington, California, Colorado. Wyoming, Arizona, New Mexico, and Texas. Twenty-four Type I Incident Management Teams were committed to fires in the Southwest, Great Basin, the Northwest, Northern Rockies, California, and the Rocky Montain Areas. In addition to all contract and available "call when needed" (CWN) airtankers being committed, eight military C-130s equipped with Modular

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Airborne FireFighting Systems were mobilized for suppression assignments in Arizona. From July 8 to July, 11,51 missions were flown for a total of 45 flight hours and 157,000 gallons of retardant were delivered to fires. The eight C-130s were again mobilized on July 30 for fires in Southern California. From July 30 to August 7,260 missions were flown for a total of 268 flight hours delivering 6,750,000 gallons of retardant. By month's end, fires in California, Idaho, Montana and Oregon were exhibiting extrme fire behavior due to extremely dry conditions and high temperatures. Commitment of wildland firefighting resources occurred rapidly and were soon depleted. The Sixth Army was tasked for support on July 30 for fires in Eastern Oregon. Military support was comprised of tow Army battalions (1,000 firefighters plus support).

Extreme conditions continued into August and the Sixth Army was again tasked for support on August 1 for fires in Idaho. Military support included tow Army battalions. Helicopters for personnel transport were depleted and on August 3 the Sixth Army was tasked for helicopter support. The military provided 16 HU-60 and 3 UH-1 (Type II helicopters) for use on fires in Idaho. Another Type I Incident Management Team was assigned to Idaho and one to the Northern Rockies. Due to the duration of fires in Idaho and Oregon, as well as new starts in Southern California, an additional 319 crews and 1,717 overhead were mobilized. By mid-month cooler temperatures and precipitation was aiding firefighters and by August 18 all military resources had been released. By the en of the month all of the project fires had been contained.

Indications at this time are that the fire season will continue in the Pacific Southwest where drought conditions, high temperatures and low humidities are persisting. Log-range forecasts, coupled with current weather patterns and a strong possibility of off shore wind conditions, show no relief for this area. These conditions are expected to continued into November.

FIRE MANAGEMENT STUDY GROUP
UNITED STATES REPORT

INTRODUCTION

Washington Office replacing Dick Chase who moved to the Fire Lab in Riverside. Tom Quinn, Director of Fire & Aviation Management in the Rocky Mountain Region retired and was replaced by Ray Evans. Bill Baden also retired from the Forest Service and is here representing the National Fire Protection Association. We will hear from him later during a report on the status of the wildland/urban interface initiatives. Dick Stauber replaced Bill as the Forest Service Director at the Boise Interagency Fire Center. John Mckelvey, Forest Service National Mobilization Officer has been transferred to Arizona to work on special projects and will be replaced shortly by Woody Williams.

1989 FIRE ACTIVITY SUMMARY

Fire activity in 1989 was not as extensive as was seen last year. However, due to heavy lightning activity in late July, hundreds of fire starts occurred in Oregon and Idaho. This, coupled with several large fires in California, stretched the capabilities of the wildland fire agencies and necessitated the mobilization of military resources.

Fire activity began in mid-February in the Southeast, with the commitment of a Type I Incident Management Team to a fire on the Okefenokee National Wildlife Refuge. Drought conditions contributed to extend fire activity in Florida. Two Type II Incident Management Teams were mobilized locally and tow crews were mobilized from the West.

Some fire activity continued in the Southeast in March and another crew was mobilized from the West. Fire activity spread westward with activity beginning in the Southwest. A Type I Incident Management Team was committed to the Valdez oil spill in Alaska by month's end.

In April activity was continuing in the Southeast and southwest with minor activity starting in the Rocky Mountain Area, California and the Northwest. Tow crews were mobilized nationally in support of fires in the Rocky Mountain Area. A Type I Incident Management Team from California was committed to a fire in Florida and another was mobilized from the West to New York to manage a fire burning underground in an old landfill suspected of containing hazardous materials.

Fire activity in May increased in both the Southeast and Southwest with continued activity in the Rocky Mountain Area spreading into Utah. Severe drought conditions in the Southwest necessitated the movement of 10 crews, 33 smokejumpers and 59 overhead personnel fromo ther geographic areas. Internally, one Type I Incident Management Team and thee Type II Incident Management Teams were also committed in three Southwest. Extreme conditions in Florida continued and fire activity resulted in the movement of five crews from other geographic areas.

FIRE MANAGEMENT STUDY GROUP

UNITED STATES REPORT

ENGINE CONVERSION OF THE CL-215 AIRTANKER

The first airtankers acquired by the province of Quebec in 1960 were Catalinas PBY 5-A, also called CANSOS. A few years later the idea of improving the efficiency of skimmer aircraft used in forest fire fighting operations led to the development and constructions of the CL-215 [Canadair].

Quebec took delivery of 15 CL-215's in 1970. It took about 10 years for the operator of the fleet, the Quebec Air Service (Q.A.S.), to really master, among other things, the mechanical aspect of the operation, particularly the engines which have been, since the beginning, the object of steady concern.

In 1984, after an analysis of the data available, the Q.A.S. reported that the quality of the engine revisions was clearly declining while the cost was increasing rapidly. The number of hours of operation between overhauls averaged 540 as opposed to 1,300, as authorized by Transport Canada for those particular engines. It should be noted though, that fire bombing is much more demanding on the engines compared to cruise flying, for which the engines were built.

After a thorough analysis of various alternatives, the Q.A.S. an Canadair (the designer and constructor of the plane) selected a turbine engine of the PW-100 family as a replacement for the actual piston engines. It is generally accepted that the airframe of the Cl-215 will last at least another 30 years.

In 1988, Quebec awarded Canadair a contract to convert 2 of its Cl-215's into prototypes for centification purposes. In June of this Year, the Government of Quebec approved the modification of the rest of the fleet (17- CL-215's at a cost of 106 million $ (1989 $). The turbinization program will spread over a 6 year period beginning after the final certification is completed by the end of next summer.

A number of potential advantages and gains, resulting from the conversion, have been identified: more powerful engines, increased capacity of the water reservoirs, higher speed, lower maintenance and operating costs, reduced downtime, vetter availability of jet fuel as opposed to aviation gasoline, etc. The major disadvantage is the high cost

Weather radar observations of rainfall are considered to be useful, for the quick detection of scattered precipitation zones associated with thunderstorms. Unifortunately, in Canada, radar coverage is available only for populated areas. Those sectors are not necessarily the most critical with respect to forest fires.

The idea of setting up, testing and evaluating radar for the tracking and measurement of scattered precipitation materialized in 1984 through an agreement between PNFI, McGill University and the Societe de Conservation de l'Outaouais (SCO). As a result of this cooperative effort, an experimental low end radar has been installed and assessed during the last 4 years at Maniwaki, in southwestern Quebec.

The final report from McGill published in 1988 as well as the assessment made by the user (namely the SCO fire centre) and the researchers established the indisputable usefulness of the results and demonstrated that continuous coveraga of the territory under intensive protection in Quebec (520 000 Km2) was possible, at an acceptable cost.

Phase II of this project has been under way during the last 6 months. Its purpose is to determine the feasibility of constructing in house, (i.e. the fire protection agencies) an economical radar (50 to 6000$) working in the X-band, equipped with a radome, with a range of 100 km, installed on top of a 15 to 20 meter tower in a remote area powered by batteries charged by solar panels and/or wind chargers.

The transmission of the data will be through the use of a customized radio packet switching system designed for the Quebec lightning detection network.

The necessary technical guidance for the appropriate assembly of the mechanical and electronic components has been acquired from McGill. The first unit of this second generation of radars will be tested in the field this fall.

It has been identified that a fair amount of software programing will be required to compliment and improve the basic computer programs which have been provided by McGill and PNFI. It is expected that the project will require a further 5 years to refine the various components and to complete an eventual network of some 15 inits to cover the territory.

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In 1987, a contract was let to BOMEM Inc. of Quebec City for the development and testing of a pre-prototype device. During the preliminary portion of the development phase, a number of field tests were carried out using a Hughes 500 D helicopter for the platform and target fires in forest

cover which represented actual 1/4 to 1/2 hectare forest fires. The tests were carried out under various sky conditions, altitudes and sighting angles from the target.

The tests confirmed the feasibility of developing, over a 2 year period, a simple device which could be strapped on to a Cessna 310 type aircraft. The main features of the system would be:

- An instrument capable of detecting the target fire size described above, 75% of the time, at a maximum angle of 72 degrees, at an altitude of 6 to 8 000 feet.
- Instrument resolution: 0.75 to 1 milliradian.
- Output: a simple device limited to a series of lights indicating the relative position of a target from the flight path.
- Development cost, approximately 500 000$ and production cost that should not exceed 60 000$ per unit.

During the last 12 months, efforts to secure funding for the project were nearly finalized through the Federal Government's Unsolicited Proposals Program and the special projects money available within the Quebec forest fire protection agencies. A recet change in Federal policy regarding financial support given to technical development programs resulted in the withdraw of the Federal grant.

New approaches for the funding of this top priority project are being investigated. It would be safe to say that a dozen initis of the Bommen fire detector could be in use in the province of Quebec within the next 5 or 6 years.

PRECIPITATION RADAR.

Rain remains the factor having the most direct effect on forest fuel moisture.

REPORT ON SPECIAL, ITEMS

Régis Proulx

September, 1989

AIRBORNE INFRARED FIRE DETECTOR.

The history of large fires in eastern Canada reveals that many are the result of deficient detection during periods of poor visibility.

On July 3, 1989, in the province of Quebec, lightning storms occurred at the end of a burning cycle that had the potential to start a number of serious fires concentratedin 3 or 4 limited areas of 5 to 10 000 square kilometers each. The fire danger indices combined with the information provided by the lightning strike detection system allowed for the quick identification of those critical sectors. Unfortunately, on the following day, low visibility resulting from haze and smoke produced by large fires burning in the far north of the province led to the late discovery, at noon, of a series of six or seven fires ranging in size from 1 hectare to 2 hectares, burning in a 2 square kilometre area located in one of the critical sectors. Those fires rapidly joined together and when the first waterbombers arrived the place was too intense to be effectively fought. This resulted in a 3 800 hectare fire.

It has long been recognized that the use of an infrared device carried on an aircraft could help solve that particular problem.It is obvious that those fires should have been detected at dawn so that the initial attack by the airtankers and the organization on the ground could have been completed by 10 A.M.

Research efforts in the sixties and the seventies, namely in the USA, led to the development of an infrared fire detector which, today provides excellent fire mappoing services.

The province of Quebec, in collaboration with the Petawawa National Forestry Institute (PNFI), has undertaken the development of an economical infrared detection device for use with conventional detection aircraft in hazy, low visibility situations.

RESEARCH INPUT - FMSG ANNUAL REPORT

OVERVIEW OF CURRENT FIRE RESEARCH PROJECTS - WHO'S DOING WHAT, WHERE?

When research loocks at the needs of wildland fire management, it must take a very wide view. Since the objective of fire research is to support the wildland fire community as a whole, our clients include a variety of other Satate and Federal agencies with fire management responsibilities, as well as National Forest Systems (NFS) and State and Private Forestry (S&PF). A strong part of our program also includes cooperative work with fire managers and researchers internationally. Since the Forest Service is primarily a natural resource management agency, we have the unique opportunity to see first hand what's involved in dealing with the complex array of issues at play in resource and wildland fire management.

The foundation of our program is in the field-based research taking place at our laboratories across the United States. Currently there are thirteen Forest Service research projects conducting studies on Various aspects of fire or fire related concerns. Much of this work is also done in conjuction with colleges, universities, and other scientists.

Here are some very brief highlights of the fire research projects underway:

INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION

Fire Behavior: Fundamental and Systems Development, Richard Rothermel - Project Leader, Intermountain Fire Sciences laboratory, Missoula, Montana

This project is conducting fundamental and applied research on forest and rangeland fire behavior as needed by fire and land managers for systematic planning, prescribed burning, and control of wildfires. The goal is to further develop our understanding of fire behavior under many different conditions and be able to quantitatively model that bahavior. This research will lead to the development of an integrated Fire Danger/ Fire Behavior System.

Fire Suppression Research,
Charles George - Project Leader, Intermountain Fire Sciences Laboratory Missoula, Montana.

Using both fundamental and applied research, this project is working to develop the knowledge base and application systems needed to improve fire control capabilities at reduced costs. The primary focus has been on chemical retardants and delivery systems and improving the effectiveness and efficiency of fire suppression techniques and tactics. Research is starting on the special suppression needs in the wildland/urban interface.

Prescribed Fire and Fire Effects, James Brown - Project Leader, Intermountain Fire Sciences Laboratory, Missoula, Montana.

This project is working to determine the effects of fire on forest, range, and wilderness ecosystems. They are modeling fundamental fire effects relationships and developing guides and information system for applying fire effects knowledge to the planning and execution of prescribed fires. Much of their work is focused on meeting silvicultural, range management, and natural area objectives in the Interior West. Work is also being done to develop knowledge and technology for supporting the special needs of aplication of prescribed fire in wilderness and natural area ecosystems. This project recently developed the automated Fire Effects Information System and is currently working on the technology tarnsfer phase.

Combustion Processes: Fire and Emission Characterization, Darold Ward - Project Leader, Intermountain Fire Sciences Laboratory, Missoula, Montana.

Research is being done to characterize combustion processes and emissions from burning forest and rangeland fuels. Not enough is known about the relationships among fire behavior variables and resulting emissions or about wildland smoke characteristics for incorporation into current emission inventories and smoke management guidelines. There are also concerns about combustion products from chemically treated forest fuels and wood products. The results of these and other studies are being used by scientists from the occupational health fields to better understand the health effects of wildfire smoke on firefighters.

NORTH CENTRAL FOREST EXPERIMENT STATION

Interactions Between Wildland Fire and the Atmosphere, Moist Temperate Forests and Society,
Linda Donoghue - Project Leader, Michigan State University, E. Lansing, MI

This project's emphasis is to increase our knowledge of how atmospheric and socioeconomic environments influence wildland fire activity and how wildland fire, in turn, affects moist temperate forests and society. Project scientists will be simulating the formation and development of horizontal roll vortices in crown fires; developing a national information system to predict wildland fire severity; and identifying and classifying wildland/urban interface areas in the Northeast using remote sensing data and GIS technology. This research will assist wildland managers with management planing and decision- making.

PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION

Silviculture of Interior Pacific Northwest Forests,
Johanna Landsberg - Project Leader, Silviculture Laboratory, Bend, Oregon

This project is conducting research on the silvuculture and regeneration of interior Pacific Northwest mixed conifer forests. Fire is an integral part of the ponderosa pine ecosystem. An emphasis of the project is to look at the use of prescribed fire as a silvicultural tool in ponderosa pine systems and the affect of reintroducing fire (after 70 years of suppression) on tree growth, physiology, and on soil nutrients.

Fire and Air Resource Management,
David Sandberg - Project Leader, Forestry Sciences Laboratory, Seattle, WA.

With the continuing and growing concerns about air quality and the potential implications to the use of prescribed fire, research is being done to provide answers for more effective use of prescribed fire to achieve resource management objetives while continuing to reduce resulting pollutants. Studies are focusing on methods to predict and describe the immediate effects of fire use in various situation, characterization of emissions from prescribed fire relative to different burning conditions, and evaluation of techniques and strategies to reduce air

pollutant emissions from prescribed fire. Throug a cooperative effort with the Alaska Bioenergy Program, the project has produced a video tape which focuses on this research and emission reduction accomplishments by forest managers. In addition, a cooperative effort with EPA, has recently led to revised emision characteristics of wildland fuels.

PACIFIC SOUTHWEST FOREST AND RANGE EXPERIMENT STATION

Chaparral Ecology and Fire Effects in Mediterranean Ecosystems, Susan Conard - Project Leader, Forest Fire Laboratory, Riverside, Calif.

Ongoing research is being done to increase our understanding of the factors that influence dynamic processes, such as erosion and vegetation development in chaparral and associated woodland ecosystems, with particular emphasis on responses to fire. Since fire is such an integral part of the chaparral ecosystem, the products of these studies are assential for improving management of these areas. Emphasis is being placed on understanding the impacts of prescribed and wildfire on erosion, sedimentation, and streamflow; responses of longterm productivity of chaparral ecosystems to fire; understanding the relationships between physical site characteristics and the growth characteristics of individual species; and providing information on impacts of fire and air pollutants on nutrient cycling in chaparral ecosystems.

Meteorology for Fire Severity Forecasting,
Francis Fujioka - Project Leader, Forest Fire Laboratory, Riverside, Calif.

Work is being done to create tools for medium - (10-day) and extended-range (30-day) weather predictions for fire management applications on local, Regional, and national scales. We need a better understanding of the magnitude, duration, and the spatial variations of fire severity for effective presuppression management and deployment of fire suppression resources.

Because weather forecast accuracy degrades at the longer ranges, this information needs to be accessible to fire managers in a context that will allow them to evaluate the forecast reliability relative to the risks involved with the decision at hand.

Prescribed Fire Research,
Andrea Koonce - Project Leader, Forest Fire Laboratory, Riverside, Calif.

This Project is researching the use of prescribed fire to help meet resource management objectives. Emphasis will be on developing prescriptions to restore disturbed or degraded habitats and to maintain ecological structure and function in wildland ecosystems; using prescribed fire to enhace resource values such as ecosystem productivity, biodiversity, and individual species vitality; use of prescribed fire to reduce losses from wildfire; and evaluating aspects of fire behavior to be included in fire prediction and resource allocation models used in fire suppression. The project is also cooperating with international scientists, doing research on fire affects, vegetation management and sustained yield.

Fire Management and Economics,
Richard Chase - Project Leader, Forest Fire Laboratory, Riverside, Calif.

Recognizing that the wildland/urban interface is basically a "people problem", this project is exploring the political, economic, sociological and demographic dimensions in addition to the physical attributes, in order to better understand the overall dynamics of the issue. A focus will be to determine what educational, regulatory, or other approaches would be acceptable and effective in mitigating potential fire-related problems. This project is also initiating research studies of the use of geographic information systems (GIS) for fire management planning and operational decision support and the development of systems for more efficient allocation and management of fire resources.

SOUTHEASTERN FOREST EXPERIMENT STATION

Forest Meteorology and Eastern Fire Management,
James Paul - Project Leader, Southern Forest Fire Laboratory, Macon, Georgia.

Research is being done to better understand weather and forest ecosystem relationships in southern and eastern environments and provide forest managers with the tools for managing fires and resulting smoke. Basic weather/smoke relationships and guidelines are needed to manage the serious problem of smoke on the highways resulting from burning. Work is also underway to make the National Fire Danger Rating System (NFDRS) more effective for the moist eastern forests.

FORES PRODUCTS LABORATORY

Fire Safety of Wood Products.
Susan LeVan (PL) - Forest Products Lab, Madison, Wisconsin.

This project is working to generate technology for improving fire safety of wood-using structures. It includes development of data base and design methodologies to define the effects of new technologies in wood construction on fire safety and the fundamental fire and thermal performance characteristics of wood products. Work is also underway on a conceptual model that could be used in the field to assess fire hazard for structures in the wildland/urban interface.

WHERE ARE WE GOING FROM HERE ?

One of the objetives of Forest Service Research is to be able to maintain momentum on current, on-going research efforts but be perceptive of new issues as they emerge. To be able to "stay ahead of the issues" requires critical thinking, strategic planning, and interaction with a wide variety of leaders, managers, scientists, and practitioners. In a world where technology and "management challenges" are evolving at an ever-increasing rate, this requires constant awareness of changes going on around you. One such change, albeit more gradual in nature, has been the many factors combining in our environment to set the stage for the occurrence of "catastrophic fires". The recent events of the '85, '87. '88 and current fire seasons are sobering indicators of this fact. Some of the contributing factors are persistent drought situations, fuel buildups (particulary in wilderness areas), the effect of insects/desease and pollutants on wildland vegetation, and the ever increasing infiltration of development and human activities in wildland areas.

A catastrophic fire is not defined just by the total number of acres that are burned. It includes consideration of the impacts on the environment and society as a whole; physical, biological, social and/or economic. Catastrophic fires can be categorized into two broad groups: 1) those that are particularly damaging from a natural resource standpoint, and 2) those that are particularly destructive to life and property. The solution to catastrophic fires, if there is one, goes beyond the specific tools and technologies of fire suppression. Many of the answers probably lie in the broader arenas of societal, economic and political factors as well as the physical and biological elements at play in the environment. Additional thinking and research is going

to be needed to assess what can really be done to minimize the occurance and impacts of catastrophic fires. Much of the research currently underway will undoubtedly play an important role, but we have to make sure we understand all the questions before we can define solutions.

GLOBAL CLIMATE CHANGE RESEARCH

Another emerging issue that has an indirect cause-and-effect relationship to fire is global climate change. Awareness, nationally and internationally, is increasing regarding this phenomenon and Forest Service Research has an important role to play. Predicted global climate chage would significantly affect the health, productivity and diversity of forest ecosystems worldwide.

As more pollutants and gases such as carbon monoxide and carbon dioxide (one source of which is fire) are poured into the atmosphere, it not only accelerates changes in atmospheric chemistry but can eventually contribute to changes in fuel characteristics such as species composition and biomass. This in turn can lead to changes in fire frequencis and severity.

Some of the major questions that the Forest Service must address in global change research are: 1) What processes in wildland ecosystems are sensitive to physical and chemical changes in the atmosphere? 2) How will future physical and chemical climate changes influence these ecosystems? 3) What are the implications for forest management and how must forest management activities be altered to sustain forest health, productivity, and reduce risks of wildfire? Research efforts are already underway to start examinig these and other questions that will help us prepare for potential changes in our ecosystems.

"FIRE MANAGEMENT AND RESEARCH NEEDS IN MEXICO" ARTICLE

As part of the continuing cooperation between USDA Forest Service and Mexico, supported by the Fire Manaagement Study Group of the North American Forestry Commission, information is being shared regarding the fire research needs, opportunities, and accomplishments related to the wildfire and prescribed fire issues in Mexico. One such example is a recently published article in the Journal of Forestry (August 1989 issue) describing a visit to Mexico by two fire researchers from the Forest Service. Their visit

was in response to a request to assist in evaluating fire research needs in Mexico and to identify potential fire research areas for joint participation and our mutual benefit. The visit has resulted in a better undderstanding of the needs that exist and identification of problems which need to be overcome to better utilize the knowledge and technology which is available within Mexico as well as other countries.

FIRE EFFECTS INFORMATION SYSTEM DEVELOPED

The Fire Effects Information System (FEIS), a unique approach to knowledge management with multidisciplinary application, has been developed by researchers at the Fire Sciences Laboratory in Missoula, Montana. It is an easy to use computer system that stores and retrieves state-of-the knowledge fire effects and related biological, ecological, and resource management information about plant species, plant communities, and associated animal species. The information provided by the system is in English language text and is organized in an encyclopedic fashion. Although designed to aid prescribed fire planning, much of the information provided by FEIS is equally useful for planning other vegetation management treatments including rehabilitation and restoration projects following wildfire or other disturbance. Technology transfer efforts directed at interagency implementation of FEIS are currently underway.

THE EFFECTS OF SMOKE ON FIREFIGHTER HEALTH

Concern has grown over the last several years regarding the effects of wildfire smoke on firefighters. This past year, the Congress of the United States appointed the Forest Service, along with Johns Hopkins University, to develop a comprehensive study plan which would detail the current state-of-knowledge regarding this topic and provide for a full evaluation of the health hazards of exposure to forest fire smoke. Under the auspices of the National Wildfire Coordinating Group, This direction was carried out in January 1989 when Forest Service Research sponsored a workshop on "The Effects of Forest Fire Smoke on Firefighters" in San Diego, California. Participation at the workshop consisted of firefighters, union leaders, fire management specialists, occupational medicine specialists, toxicologists, industrial hygenists, and a variety of scientists from State, Federal and academic institutions. The resulting Study Plan has identified specific data and research needs and has been submitted back to Congress for consideration in the Federal budgeting process.

JOINT CANADIAN FIRE EXPERIMENTS

This past year a cooperative effort with Canada has been underway to examine some important characteristics of fire dynamics. Large wildfires and some prescribed fires create winds that are driven by the fire and often these winds overcome ambient wind patterns-- seemingly producing a small- scale wind system that drives the fire. In addition, smoke production from large-scale fires and machanisms of removal of smoke from the atmosphere have never been adequately studied.

The Canadian large-fire experiments are part of an interagency research project conducted by the Intermountain Research Station of the Forest Service in cooperation with Forestry Canada, Defense Nuclear Agency, National Institute of Standards and Technology and other universities and agencies. The experiments were designed to measure the rate of heat release, fire induced winds, and fire spread phenomena in conjuction with the large-area fires. In addition, measurements of the characteristics of the gases and particles released from the fires were studied from ground-based towers and from airborne sampling systems flying through the convection column and at various distances downwind from the fires.

One of the fires was 380 hectares in size, and produced a large capping cumulus cloud extending to an altitude of 25,000 feet. It resulted in a fire-induced thunderstorm with at least six individual lightning discharges and was reported to have produced over an inch of rain at downwind locations. This was the only lightning activity in the area. One of the objectives of the experiment included the measurement of the effectiveness of cloud processes on the removal of particles and gases from the smoke plume as the plume was processed by the cumulus clouds.

The results of the fire experiments are currently being analyzed and will provide valuable information and knowledge about the complex interactions between large fires and atmospheric phenomena.

NATIONAL WILDFIRE COORDINATING GROUP (NWCG) ACTIVITIES

NWCG is continuing to emphasize the development and implementation of the wildland/urban interface initiatives. Also, the Group is coordinating the implementation of the actions resulting from the 1988 Fire Policy Review. Other activities by of the working teams or committees include:

Fire Equipment Working Team (FEWT)

The Team continues cooperative effort with the Forest Fire Equipment Subcommittee (FFEES) of the Canadian Committee on Forest Fire Management. The thrust of cooperation is in the development of fire foams and accessories.

An additional step toward closer cooperation has been accomplished. Mr. Gordon Ramsey, Chairman of FFES has been appointed as an adviser to FEWT. Mr William Shenk, Chairman of FEWT has been appointed as an adviser to FFES.

Training Working Team

Emphasis is being placed on revision of the fire suppression curriculum to improve efficiency and reduce training time and costs. During the revision, an effort is being made to clarify the separation of the Incident Command System (ICS) organizational management training from specific skills. This will allow common use of ICS organizational trainig by all emergency practitioners who will then add specific skills training based on their responsibilities, i.e., suppression skills, law enforcement skills, emergency medical aid, etc.

Incident Command System Working Team

Major revision of the Fireline Handbook has been completed. Distribution of the Handbook is expected this fall. The Working Team is reviewing possible changes to the "Qualification and Certification Guide" and the addition of new ICS forms.

Prescribed Fire & Fire Effects Working Team

Work is nearly completed on a video that describes basic uses of prescribed fire entitled, "The Role of Prescribed Fire in Resource Management". In addition, emphasis is being placed on implementing the Fire Effects Information System (FEIS) described earlier. The Working Team was given approval to add a subcommittee to coordinate future efforts.

Wildfire Prevention

A wildfire prevention training course dealing with person-to person communications is nearing completion. The title of the course is "Interpersonal Communications".

The Team has completed the development of a "Wildfire Prevention Handbook" which is available from the Boise Interagency Fire Cache. They also prepared a Wildland/Urban Interface Reference Guide which lists over 200 references and sources for books, videos, Journals and other materials.

Information Resource Management Working Team

This is a newly formed Team with a mission to identify policy-level information issues that affect, or are likely to affect, interagency fire management activities and to provide advice to NWCG members on how to address those issues through information and communication systems.

Publication Management System (PMS) Unit

Materials are provided to all NWCG participants through the Publication Management Unit at hte Boise Interagency Fire Center. A new "National Fire Equipment System Catalog, Part 2: Publications" is available which describes training courses, handbooks, guides, and other materials available to users.

Fireline Safety Committee

The Committee developed a brochure that lists available safety related training courses, videos, publications, and accident investigation reports. Sources for the materials are also identified.

A national level focal point for on-going and future studies on the effects of smoke on firefighters will be provided by the Missoula Technology Development Center with overall guidance from the Committee.

During the 1989 fire season, 48 firefighters were entrapped, three received serious burns and one lost his life. Three others lost their life, one from drowning, one hit by lightning, and one from a felled tree.

1989 MAJOR ACCIDENTS AND NEAR-MISSES
ENTRAPMENTS

DATE	FIRE	PLACE	PERSONS	SHELTERS DEPLOYED	INJURY
3/27	Buckhorn	Ohio	5(St)	No	1-fatal 1-burns
5/31	Gentille	Florida	1(St)	Yes	Burns
6/16	Bonita Spr.	Florida	1(ST)	Yes	Burns
6/24	Shelly	Gila NF	41(FS)	Yes	1-smoke

OTHER FIRE ASSOCIATED ACCIDENTS

DATE	FIRE	PLACE	PERSONS	TYPE	INJURY
7/9	Molera	California	6(CDF)	Tree Fell	1 Fatal 5 Minor
7/10	Horton	Tonto NF	1(BIA)	Lightning	1 Fatal Ernie Cachini
	Curren Mtn	Payette NF	1(FS)	Drowning	1 Fatal

Aviation Standards Committee

NWCG approved standards, developed by the Committee, for the use of single engine airtankers to ensure safe operation with other resources. The Committee is developing a technology transfer package for implementation.

InciNet Steering Committee

Incinel is an interagency project sponsored by the National Wildfire Coordinating Group To Provide a standardized computer and telecommunication system which can operate at remote fire locations and provide the data processing and telecommunication requirements of the incident.

Several types of hardware configurations have been tested. An integrated system consisting of a microcomputer starter kit and a minicomputer expansion kit is now being developed for testing. The starter kid would be highly portable and could be dispatched with the Incident Management Teams. As the fire grew large or more complex, the expansion kit could be ordered. The starter kit would integrate with the large system serving as a graphics workstation and performing system backup. If the test is successful, development may begin in late 1990 for the full system with total implementation expected in 1993.

UNITED STATES DEPARTMENT OF THE INTERIOR INPUT - FMSG ANNUAL MEETING.

The Department of the Interior includes the Bureau of Land Management, the National Park Service, the Bureau of Indican Affairs, and the Fish and Wildlife Service. The Bureau of Land Management provides much of the evaluation and development work for the Department relating to fire suppression and systems design. The following outlines some of the projects that are currently ongoing with the Department.

Initial Attack Management System

The Initial Attack Management System (IAMS) is a computerized decision support system that was developed by the Bureau of Land Management. IAMS provides additional intelligence to Fire Managers to more effectively perform fire detection, preposition forces, and dispatch initial attack resources to new fires.

IAMS consists of three subsystems. The Automated Lightning Detection System detects the location of ground lightning strikes and graphically portrays them on a computer screen at local offices. The network of Remote Automatic Weather Stations transmits hourly weather readings to the local computers via the GOES stallite. The third subsystem is the composite of hardware and software which accesses satellite fuel and terrain data and provides predicted fire danger and fire behavior modeling.

The Bureau is currently updating both the hardware and software of IAMS to provide increased speed and more flexibility in application. The new system (IAMS II) is expected to be operational by the 1992 fire season and will provide graphic displays approximately 100 times faster than the current system.

"Blowgun"

The Blowgun is a compressed air powered, ground firing device for use in either prescribed fire or wildfire. The gun is semi-automatic in operation and fires an incendiary projectile up to 500 yards. The projectile used is the plastic, molded "ping-pong" ball type which is housed in an eight round magazine. A safety/trigger injection system allows for the safe ejection of live rounds if a misfire occurs. Marker rounds are also provided for initial aiming purposes.

The Blowguns' principle application is prescribed fire in heavy slash or brush fuels. Alternative firing methods include either costly aerial ingition, or ground ignition by crews which has yielded a significat number of injuries due to heavy slash fuesl. The Blowgun offers an inexpensive and safe option for firing operations, which should lower cost per acres of treatment and reduce injuries to personnel formely involved in ground f'ing operations.

All design and initial field tests for speed, ease, reliability and performance have been completed. The first two operational units are to be delivered in early 1990 and both video and photo documentation of field use of the blowgun will then be conducted on prescribed fires. Results of this field use should be available by Fall of 1990.

Fire Effects Information System

The Fire Effects Information System (FEIS) provides easy user access to state-of-the-knowledge literature reviews about the effects of fire on plant species, animal species, and plant communities. Proposed by the USDI Bureau of Land Management and developed by the USDI Forest Service Intermountain fire Sciences Laboratory, this system has been funded by the Bureau of Land Management, Forest Service, and the National Park Service. The system currently contains information on 211 plant species, nine wildlife species, and ten vegetative cover types. The program currently can be accessed through a computer at the Intermountain Fire Sciences Laboratory and also available through the Initial Attack Management system (IAMS) computer at the Boise Interagency Fire Center.

Plans for Fiscal Year 1990 are to continue adding to the

knowledge base with funding for selected species provided by the Bureau of Land Management, the National Park Service, and forest Service. Over the following three years, it is proposed to add about 600 plant species to the system to

provide fairly complete national coverage for important plants. It is intended that the program be made available to all government and non-government users, probably through the Fort Collins (Colorado) Computer Center. Individual agencies can continue to download the Fire Effects Information system to their own computer systems if they so desire.

Fireline Explisives

The fireline explosives (FLE) program was initiated by the U.S. Forest Service in Missoula, Montana in the early 1970's. In July, 1977 the Bureau of land Management used FLE for the first time in Alaska. FLE provides a capability for constructing long trench lines rapidly with a relatively small workforce. In one hour, an eight person blasting team can lay out and blow about 1500 feet of trench line, a full day's production for a good 16-person crew digging similar trench line with hand tools. Although it does not replace firefighters as the key alement in ground based firefighting efforts, when used properly FLE can dramatically increase and enhance a crew's ability to construct a fire line. The BLM believes FLE can be an effective firefighting tool, providing firefighters with a safe, efficient and cost effective method of constructing line. Use of FLE has increased each year since the program was developed and the BLM expects this trend to continue.

Ram-air Parachute Development

In 1979 the Bureau of Land Management Smokejumpers began examining ram-air paerachutes for potential use in smokejumping operations. Smokejumping operations until then had been performed using round canopies which operate as drag devices to lower a smokejumper to the ground. The ram-air parachute, an inflatable wing that operates on a glide principle, was bound to be much more versatile than a traditional round canopy. In 1987, after having used various commercially available models both operationally and experimentally, the BLM decided to contract a parachute manufacturer to design a parachute specifically for smokejumping. The result is the Quantum Parachute Inc. "Q-5",an accuracy canopy that gives smokejumpers the

reliability, maneuverability and landing characteristics they are seeking. The Q-5 is in the formal stages of field evaluations and is expected to be the BLM canopy of the future.

Fuels Management

During recent years, the Bureau of Land Management has initiated studies that focus on methods to successfully break up the continuity of fuels in the arid and semi-arid northwest United States. One of the most successful programs is greenstripping, which involves planting fire-resistant strips of vegetation that retard the spread of fires.

The greenstrippinmg program has tow major emphasis for 1990. The first is research to determine the appropriate species that are fire tolerant, provide maximum fire-resistance, and are palatable forage for wildlife and cattle. This research is being conducted by the U.S. Forest Services's Shrub laboratory at Provo, Utah and the University of Idaho. The second emphasis is directed toward the predictive fire behavior, location and width of the greenstrip, and its tactical use in containing wildfires. This study is a cooperative effort between the BLM Idaho State Office and the Boise Interagency Fire Center.

STATE INPUT - FMSG ANNUAL REPORT

The National Association of State Foresters is making a concerted effort to mobilize the nation's Volunteer fire Departments into a national force of firefighters. They are doing this in an effort to respond to the Urban wildland Interface fire problem. The number of Volunteer Fire Departments in each State range from 1,000 to 3,000 in number of units. It should be readily evident that this could constitute a vast army of firefighters once they are mobilized under a unified command system.

In the United States the Volunteer Fire Departments are comprised of men and women who are self-supporting and willing to leave their daily work to respond to emergency situations. These dedicated individuals not only give of their time and talents to serve their communities in fire protection, but also can be found on any Saturday selling fried chicken at the fire house to raise funds for equipment and supplies.

During the fires at Yellowstone in 1988 and again this year in Montana, the State Foresters used a considerable number of the VFD's to supplement the fire forces they dispatched t

to the fires in the northwest. A number of State forestry organizations have been training the Volunteer Fire Departments under the Unified Command System at their own expense. This, of course, limits the number of men and women that can be trained in a given year because of the demands on our time for other programs.

With this in mind, we have drafted a bill entitled, "The National Fire forces Mobilization Act of 1989", and have solicited sponsors in Congress to introduce the bill during this session. In capsulation, the bill requests the authorization to appropriate $100,000,000 each year for five consecutive years. Of the appropriated funds, 45,000,000 will be passed through to the Volunteer Fire Departments to upgrade their equipment to fight fires in the Wildland Urban Interface environment. An additional $45,000,000 will be designated for State forestry organizations to use in their fire suppression efforts, upgrading their equipment and training the respective Volunteer Fire Departments in their State. The remaining $10,000,000 will be provided to the U.S. Forest Service to administer the program for Congress.

We, the national Association of State foresters, are very enthused and optimistic about our ability to lobby this bill through Congress with support from the Volunteer Fire Departments of the nation. If we are successful, we will have achieved a National Guard of Firefighters similar to the National Guard that responds militarily to the nation's needs with the exception that these firefighters are self-supporting until they are called into service.

NATIONAL FIRE PROTECTION ASSOCIATION INPUT - FMSG ANNUAL MEETING.

INTERNATIONAL CONFERENCE: "MEETING GLOBAL WILDLAND FIRE CHALLENGES", JULY 1989.

During the past decade, wildfires have caused major losses of life, property, and natural resources in countries around the world. As populations encroach more deeply into wildland areas and the wildland/urban confrontation expands, the potential for devastation by fire increases. The loss of human life and personal property is enormous and growing

yearly. In an effort to examine this global problem and develop methods to reverse the upward trend of wildfire losses, the International Wildland fire Conference was convened in Boston, Massachusetts on July 23-25, 1989. The sponsoring organizations included the National Fire Protection Association, USDA Forest Service, Forestry Canada, La Secretaria de Agricultura y Recursos Hidraulicos, the U.S. Department of Interior, the Agnecy for International Development's Office of U.S. Foreign Disaster Assistance, and the national Association of State Foresters. This international conference brough together 400 experts from more than 35 countries and provided a unique opportunity for participants to meet and collaborate in an effort to: 1) learn more about the severity of wildfire problems around the world, and 2) encourage international communications and increase mutual cooperation among nations.

SECRETARIA DE AGRICULTURA Y RECURSOS HIDRAULICOS
SUBSECRETARIA FORESTAL
DIRECCION GENERAL DE PROTECCION FORESTAL

23a REUNION ANUAL DEL GRUPO DE ESTUDIO DE MANEJO
DE INCENDIOS FORESTALES DE LA COMISION FORESTAL
DE AMERICA DEL NORTE

CANCUN, QUINTANA ROO, MEXICO
DEL 11 AL 13 DE OCTUBRE DE 1989

P R E A M B U L O

Antès de iniciar el reporte formal del grupo de Mèxico, es necesario mencionar que en este año se inició una nueva Administración Federal en Mèxico, en la cual se vió favorecido el Sector forestal, ya que **se creò nuevamente la Subsecretarla Forestal**, dentro de la estructura orgànica de la S.A.R.H., hecho que reviste una trscendental importancia para la actividad de protección contra incendios en nuestro pals, debido al apoyo y prioridad que en la actualidad se le està otorgando a las labores de prevención y combate de incendios forestales

También en este preàmbulo quisieramos agradecer a los CC. Ings. Jesùs B. Cardeña Rodriguez y Oscar Cadeño Sànchez por su brillante participación al frente del Grupo de Estudio sobre Manejo de Incendios forestales por parte de Mèxico durante el periodo comprendido entre los años de 1982 a 1988 y reconocer su entusiasmo e interès en las tareas desarrolladas y en la orientación para los nuevos integrantes del Grupo de Mèxico, que a continuación me permito presentar a ustedes:

NOMBRE	CARGO OFICIAL
ING. LUIS SANGRI NAMUR	ASESOR DEL C. SUBSECRETARIO FORESTAL
ING. AARON MASTACHE M.	DIRECTOR DE PROTECCION Y RESTAURACION FORESTAL. SUBSECRETARIA FORESTAL.
ING. ROBERTO MARTINEZ D.	SUBDIRECTOR DE PROTECCION FORESTAL
ING. HIGINIO PADILLA GARCIA	SUBDELEGADO FORESTAL EN EL ESTADO DE JALISCO.
BIOL.JESUS SANCHEZ CORDOVA	JEFE DE LA RED DE INVESTIGACION DE INCENDIOS FORESTALES (INIFAP)

todos ellos con amplia trayectoria en la atenciòn del problema de los incendios y quienes a partir de esta Reuniòn estaràn trabajando con nosotros para el logro de los objetivos del Grupo.

PERSPECTIVA GENERAL

Como ya se mencionò,con la creaciòn de la Subsecretaria Forestal, se preve un fuerte impulso a las acciones y programas que la S.A.R.H. ha venido desarrollando durante los ùltimos aÑos, enmarcadas en las estratègias que contemplan: la participaciòn directa del sector social y privado; la corresponsabilidad con las dependencias federales y estatales; al fortalecimiento de la divulgaciòn y de la educaciòn forestal; la capacitaciòn y adiestramiento

del personal participante en estas tareas; la modernizaciòn de sistemas, herramientas y equipos, asi como el fomento de la cooperaciòn internacional.

Lo anterior implicarà contar a lo interno, con mayores apoyos de toda indole, pero principalmente de òrden politico y presupuestario, ya que tambièn se preve un aumento en la ocurrencia de incendios forestales, ante el incremento de la poblaciòn y de èsta sobre los recursos forestales, demandando productos y satisfactores diversos, principalmente por aquellos sectores de la poblaciòn econòmicamente màs pobres.

Tambièn, ante este futuro pròximo que auguran problemas serios, la ayuda internacional en la materia, que siempre ha habido entre los paises miembros de la COFAN, tendrà un papel determinante para Mèxico en el mejoramiento de su capacidad para resolver el problema.

I. ACTIVIDADES DE PREVENCION DE INCENDIOS FORESTALES.

Debido a que en Mèxico las principales causas de incendios forestales son atribuibles a la acciòn del hombre, las actividades de prevenciòn comprendidas durante la pasada campaña estuvieron orientadas a ampliar la cobertura de la divulgaciòn y educaciòn de la poblaciòn rural y urbana

buscando modificar las conductas que originan incendios forestales.

En este sentido se ha intensificado la emisión de mensajes en los medios de comunicación masiva a través de "spots" de televisión en 2 canales de cobertura nacional y 21 canales estatales o regionales, con 3 impactos diarios en cada uno de ellos, los cuales permitieron una mayor penetración al público, siendo reforzados por más de 1,145 mensajes radiofónicos transmitidos en 229 estaciones del país.

También la campaña nacional se complementó con la producción y distribución de 120,000 carteles y tirajes similares de otros materiales impresos.

Con esta misma idea se realizaron diversas campañas en el ámbito regional y local con apoyo de los Gobiernos Estatales en coordinación con las Delegaciones de la S.A.R.H. y áreas operativas, las que han arrojado experiencias satisfactorias. De estas campañas divulgativas regionales destacó la realizada en Quintana Roo, donde a partir del paso del **Huracán Gilberto** se previó occurrirían incendios forestales, por lo que se produjeron y difundieron 2 "spots" de televisión específicos para la zona, así como 4 mensajes para radio, de los cuales dos fueron en español y 2 en maya, asimismo se produjeron folletos y volantes que fueron

distribuidos entre la población para reforzar los mensajes preventivos de incendios forestales.

En este mismo sentido es importante resaltar otras campañas divulgativas y educativas desarrolladas en otros Estados del país donde se están utilizando mensajes radiofónicos y diversos materiales impresos en idiomas nativos (Huichol en Jalisco, Maya en Yucatán y Quintana Roo, Tzotzil en Chiapas y purepecha en Michoacán), así como la producción de materiales con orientación para la población como la producción de materiales con orientación para la población infantil (Queretaro, Tabasco, Chiapas, Jalisco) y el establecimiento de actividades no convencionales de comunicación, tales como pláticas, exposiciones, teatro guiñol, organización de grupos de jovenes y niños para realizar labores de divulgación en centros escolares y de recreo (Coahuila, Querétaro, Michoacán, Puebla, Hidalgo y D.F.), para lo cual se utilizan códigos, imagenes y recursos locales y poder lograr el fomento de una conducta proteccionista de los recuros naturales por parte de la población en la zona.

Dentro de las acciones encaminadas a lograr la vinculación entre las actividades forestales, ganaderas y agrícolas que se realizan dentro o cerca de los bosques y a fin de lograr la reducción de la presión social sobre los recursos

forestales, representada èsta por el pastoreo extensivo y el cambio de uso de suelo para agricultura y ganaderia, se ha continuado durante el ciclo de siembra 1988-1989 con el cultivo de la veza de invierno (**Vicia villosa** Roth), leguminosa forrajera que se ha constituido en una excelente alternativa para reducir la quema de pastos que realizan los campesinos ganaderos en la busqueda de brotes verdes y forraje para su ganado que pasta en bosques de clima templado-frio.

De esta manera se ha ampliado el cultivo a 1400 Ha. en ocho estados del pais, con una producciòn de forraje aproximada de 25 toneladas que fueron aprovechadas principalmente para la alimentaciòn de ganado bovino y ovino. Tambièn se ha ampliado la producciòn de semilla en el pais, lo que esta ayudando a consolidar el proyecto, aunque aùn se depende en una gran parte de la semilla que se importa de Estados Unidos de Amèrica debido a la creciente demanda de semilla que se registra entre los campesinos de esas zonas forestales del territorio nacional.

Por otro lado es necesario mencionar los esfuerzos que se realizan en algunos estados del pais, y que estàn orientados a la realizaciòn de trabajos preventivos de campo, tales como quemas controladas (D.F., Jalisco, Tabasco, Mèxico,

Sonora, Chiapas, Yucatàn, Q.Roo, Coahuila y Veracruz); construcciòn y limpia de brechas cortafuego (D.F., Jalisco, Puebla, Mèxico, Hidalgo, Queretaro y Tlaxcala), asì como otros trabajos de asistencia a la poblaciòn rural para el manejo tecnificado del fuego en la quema de pastos, subproductos de cosecha, desperdicios de monte y en la tradicional agrìcultura migratoria que se realiza en bosques tropicales; la roza-tumba-quema (Tabasco, Yucatàn,Q.Roo, Jalisco, Hidalgo, Chiapas y Puebla).

II. ACTIVIDADES DE LUCHA CONTRA EL FUEGO.

En el balance estadìstico de este año, se observa que el nùmero de incendios se redujo en un 9% al pasar de 10,942 siniestros en 1988 a 9,946 en 1989, asimismo la superficie afectada tuvo un decremento de un 2%, con respecto a la temporada pròxima pasada, al registrarse 518,265 Ha., afectadas en 1988 y 1989, sòlo 507,471 Ha.

Aùn cuando para Mèxico, 1989 resultò un año con menos incendios forestales y menos superficie afectada, en relaciòn a la de 1988 que ha sido la peor temporada en los ùltimos 7 años, el presente ha sido un año especialmente crìtico por la difàcil situaciòn de sequìa que se presentò en la mayor parte del paìs de enero a julio, como lo

demuestra el hecho de que en 1989 durante esos meses la media mensual de lluvia fue 33.6 % menor a los registrados en el periodo de 1966 a 1987.

La situación descrita propició que en algunas entidades federativas como Coahuila, Durango, Nuevo León, Quintana Roo y Sonora, que en conjunto sumaron el 86% del total nacional en cuanto a superficie afectada, y donde se presentaron incendios que por su ubicación, características o dimensiones causaron expectación y alarma entre la población.

De los anteriores destacaron los siniestros ocurridos en el Norte del Estado de Quintana Roo, donde a mediados del mes de septiembre, el **huracán Gilberto** azotó la parte norte del Estado, dejando una gran cantidad de vegetación combustible acumulada, lo que aunado a las altas temperaturas y a la presencia de una intensa sequía en la región, propiciaron que los incendios que se presentaron se propagaran rápidamente, hasta alcanzar magnitudes considerables.

Para el combate, control y liquidación de estos incendios forestales la Secretaría de Agricultura y Recursos Hidráulicos, en coordinación con la Secretaría de la Defensa Nacional, la Secretaría de Marina, la Secretaría de comunicaciones y Transportes, Petróleos Mexicanos, la

Compañia Nacional de Subsistencias Populares y el gobierno del Estado de Quintana Roo y de los Municipios afectados, canalizaron recursos humanos por un total de 4,000 elementos, y recursos materiales (herramientas, equipos, maquinaria pesada, helicòpteros, aviones especializados, alimentos, etc), asi como recursos financieros del orden de 5 mil millones de pesos. Con los trabajos efectuados y con la ayuda de las lluvias indicidas y naturales que se presentaron a partir del 24 de julio, se logrò avanzar considerablemente en el combate de los siniestros, quedando controlados al 100% todos los incendios el dia 29 siguiente y extinguidos en su totalidad el 2 de agosto.

Es importante mencionar que en estos incendios fue necesario que muchos miembros del servicio forestal mexicano dieramos mucho de nuestro mayor esfuerzo, asi como a poner en pràctica mucho de lo aprendido en este grupo de la **COFAN**, durante los ùltimos años. Es asi como tambièn se requirió de la participaciòn de nuestro mejor personal que fue capacitado en **NARTC**, en los Cursos Internacionales, que el grupo de COFAN ha promovido, los cuales fueron brillantemente apoyados por los expertos; Roberto Rodriguez y John Swanson del Servicio Forestal de los Estados Unidos quienes replantearon la estrategia de combate de los incendios y nuestro personal dirigiò su ejecuciòn a travès de los contingentes de combatientes y de recursos

canalizados en la zona, por lo que aprovechamos la ocasión para hacer un reconocimiento a los técnicos de referencia y agradecer a las autoridades del **USDA** Y **OFDA** el apoyo para que ellos pudieran asistirnos en el combate de estos siniestros.

También, es ocasión para agradecer la colaboración de :Don V. Myles del Servicio Forestal Canadiense y a John F.White, Gerald P. Bauer y Steve Gallegos, del Servicio Forestal de Estados Unidos de América; a las autoridades de ambos países y a la Comisión Forestal de América del Norte (COFAN) que hicieron posible la visita y el Proyecto de Asistencia Técnica denomidado **"El Impacto del Huracán Gilberto en las Selvas de Quintana Roo, México"** que formularon dichas personas en enero de este año y que nos permitió obtener una opinión y una guía técnica para desarrollar acciones de índole diverso relacionadas a la actividad forestal en la zona.

También, otras entidades federativas donde se presentó una temporada de incendios forestales difícil fueron Coahuila y Nuevo León, donde el origen de los incendios se debió en su mayoría a descargas eléctricas, que aunado a la inaccesibilidad del terreno donde éstos se presentaron y las condiciones de extrema sequía, afectaron en ambos estados 91,130 ha. en su mayoría de vegetación arbustiva y del tipo semidesértico; por lo cual fue necesaria la movilización de

fuertes contingentes humanos y de una gran cantidad de recursos materiales y financieros; en estas Entidades existiò una destacada colaboraciòn de los Gobiernos de ambos Estados, y en el caso de Nuevo leòn con la contrataciòn de dos aviones cisterna en apoyo a las labores de combate terrestre.

En Sonora y Baja California debido a la ocurrencia de tormentas elèctiricas, cazadores furtivos y a la falta de precauciòn de pobladores rurales y descuidos de excursionistas en las àreas forestales, se originaron diversos incendios, que en suma afectaron una superficie de 95,771 ha. En estos Estados se contò, para el control de los siniestros con la destacada participaciòn de la SEDENA, los gobiernos Estatales, de ejidatarios y campesinos de la regiòn. En los incendios registrados en Baja California queremos hacer un reconocimiento por la participaciòn de 3 expertos forestales de Estados Unidos de Amèrica, en la atenciòn de dichos siniestros en la Sierra de San Pedro Martir y nuestro agradecimiento al Servicio Forestal de E.U.A., al Servicio Forestal del Estado de California y al Departamento del Interior por su intervenciòn para que este apoyo fuera posible y por el envio de aviones cisterna.

Es importante señalar que debido a los incendios de grandes proporciones de Quintana Roo, el indicador de superficie afectada por cada incendio que se presentò en el pais

durante esta temporada, tuvo un fuerte incremento, al pasar de 47 ha. en 1988 a 51 en el presente año, pero excluyendo a dicha entidad federativa, se obtuvo a nivel nacional un indicador de 39 ha. por incendio, 17% menor que la temporada 1988, lo cual muestra un mejor nivel de atención al problema, que, en general, se ha logrado en la mayor parte del país.

Así mismo, cabe destacar que no obstante la crítica situación de este año, mejoraron significativamente los resultados obtenidos en la Región Central del país, en la que tradicionalmente se habían tenido los mayores daños, ya que a pesar de que el 57% de todos los incendios del país ocurrieron en esta zona, sólo se tuvo una superficie forestal afectada de 25,837 ha., que nos dá un indicador de superficie por incendio de 5 ha., el cual se ha visto notablemente reducido, si tomamos en cuenta que en 1983 era de 36 ha., y en 1988 de 12 ha.

Por otro lado, en 1989 se tuvo un incremento en la superficie arbolada afectada por los incendios, correspondiendo ésta al 43% de la total, mientras que en 1988 este porcentaje fue de 36%, lo cual se explica por las grandes áreas afectadas por los incendios de Quintana Roo, que en su mayor parte cuenta con vegetación arbórea.

Finalmente, para los trabajos de la Campaña Nacional de Prevenciòn y combate de Incendios Forestales, en el presente año, se contò con un presupuesto federal, autorizado a principio de año, del orden de 2,883 millones de pesos, inferior en 23% al ejercicio en 1988, sin embargo se estima que existiò un apoyo econòmico de magnitud similar que canalizaron, para la atenciòn de los incendios, los Gobiernos Estatales, los productores e industriales forestales, lo que permitiò mejorar en personal y equipos. Ademàs, de los 5,000 millones de pesos, que como ya se mencionò, fueron asignados de manera extraordinaria por el gobierno federal y estatal para el combate de los incendios forestales en Quintana Roo.

III. ACTIVIDADES INVESTIGACION Y TECNOLOGIAS.

1. Investigaciòn y Esperimentaciòn en el Norte de Quintana Roo.

Debido a la necesidad de contar con informaciòn que permita evaluar la respuesta de los ecosistemas forestales tanto a los huracanes como a los incendios que, como ya se ha visto, existe una relaciòn directa en su ocurrencia en el norte de Quintana Roo, ha sido necesario el establecimiento de diversas lìneas de investigaciòn, que estàn siendo desarrolladas por instituciones oficiales y privadas siendo los temas màs importantes:

a) Ecología.- Las investigaciones se efectuan en àreas con diferentes grados de perturbaciòn. (alteradas y no alteradas por el huracòn; alteradas por el huracàn e incendiadas mediana y mayormente; alteradas por perturbaciòn mecànica; alteradas por el huracàn y con remociòn experimental de material combustible.)

Tambièn en este mismo rubro se efectùa la identificaciòn y caracterizaciòn del mosaico edàfico para obtener una regionalizaciòn y con base en esto determinar los procesos sucesionales con una descripciòn comparativa entre la vegetaciòn y su restablecimiento, para lo cual se realizarà: el estudio de la estructura de la vegetaciòn a partir de monitoreo con parcelas permanentes; el estudio autoecològico de las especies dominantes; el conocimiento de la persistencia del plasma germinal.

Por otro lado dentro de las investigaciones ecològicas, se determinaràn cualitativa y cuantitativamente los animales que estèn presentes y que se iràn reintegrando y reproduciendo.

b) En el campo de la **tecnología** se realizan estudios para llegar a conocer los usos de las diferentes especies de fauna y flora silvestre presentes en el àrea y que se dan tradicionalmente en la regiòn, las que se den fuera de ella y los potenciales.

Para poder utilizar y manejar apropiadamente las especies resultantes, sera necesario conocer su autoecologia. Tambièn se considera importante poder conocer el impacto de la remociòn experimental del material combustible muerto en el àrea.

c) en el campo **socieconòmico**, se realizan estudios para conocer y caracterizar a la poblaciòn incidente en el àrea, el comportamiento que tuvo y tendrà hacia las àreas siniestradas (aspectos de utilizaciòn y colonizaciòn) y la interacciòn existente entre la poblaciòn.

En esta linea de investigaciòn es imprescindible precisar los mètodos màs adecuados para lograr la comunicaciòn entre los tècnicos y los pobladores.

Como se puede observar el reto de trabajo es amplio en materia de investigaciòn para esta àrea forestal de nuestro pais y se considera que el poder efectuar estas investigaciones sòlo es el inicio para solucionar problemas metodològicos para el estudio y conocimiento de las selvas tropicales en Mèxico.

2. Investigaciones y Experimentaciòn en el resto del paìs

Con la creaciòn de la Red Nacional de Investigaciòn de Incendios Forestales, cuyo coordinador es ahora uno de los miembros de nuestro Grupo de Estudios de Manejo de Incendios Forestales en Mèxico, esperamos que el programa de investigaciòn propuesto a las autoridades correspondientes se establezca y consolide este año y que en terminos generales està orientado a dar respuesta inmediata a las interrogantes màs bàsicas que en la actualidad aùn no han sido resueltas en Mèxico, de esta manera el Programa de Investigaciòn contempla los temas que a continuaciòn se señalan:

PREVENCION

- Diagnòstico y caracterizaciòn de los incendios.
- Regionalizaciòn del paìs.
- Factores de los incendios.
- Sistema de indices de peligro.
- Control de desperdicios.

MANEJO DEL FUEGO (EFECTOS ECOLOGICOS)

- Comportamiento del fuego.
- Efectos sobre la vegetaciòn.
- Efectos sobre el suelo.
- Efectos sobre la fauna.

- Efectos sobre el agua.
- Efectos sobre los combustibles.
- Sanidad.

EVALUACION ECONOMICA.

- Cuantificación de pérdidas de productos forestales.
- Pruebba de metodologías de evaluación.
- Repercusión social.
- Evaluación de costos en los sistemas operativos.

TECNICAS DE COMBATE.

- Eficiencia de brigadas.
- Adecuación y validación de técnicas.
- Uso y manejo de equipos y herramientas.

3. Aspectos tecnológicos.

La experiencia que nos dejó la temporada de incendios forestales pasada, nos confirma el hecho de que para México, dada sus cambiantes condiciones físicas, biológicas y climáticas es necesario contar con técnicas, sistemas, equipos y herramientas específicas para cada una de las regiones del país, sin embargo han existido oportunidades para probar y desarrollar algunos aspectos tecnológicos desarrollados en otros países y que se han adaptado a nuestras condiciones, y que han mostrado su efectividad,

generando una experiencia que sòlo ha tenido como limitante la crisis enonòmica por la que atravesamos en Mèxico, para ampliarlas a las zonas del pais.

En este sentido una de las opciones màs ùtiles para apoyar y complementar el combate terrestre, lo constituye el empleo de equipo aèreo, cuyo uso por cinco años consecutivos en nuestro pais ha mostrado que, debido a las carencias econòmicas del mismo, debe ser impostergalbe la busqueda y concreciòn de las gestiones que nos permitan contar con aeronaves propias para el combate de incendios forestales.

A partir de esta idea se tendrà como etapa inicial para este año, la adquisiciòn de equipo especializado para adaptar 2 helicòpteros para el combate de incendios forestales propiedad de la S.A.R.H., esto debido a que, ademàs de que ya contamos con estos aparatos, el empleo de helicòpteros dada su versatilidad, nos han servido principalemnte para la canalizaciòn oportuna de personal, equipo, alimentos y agua a los incendios durante su combate y pretendemos con esta incorporaciòn tambièn usarlos para las acciones de lucha contra el fuego.

Con estos equipos aèreos especializaos, que creemos puedan estar listos al inicio de las siguiente campaña, no sòlo estaremos en condiciones de asignarlos para el combate de incendios en las àreas màs criticas del pais, sino tambièn

iniciar las negociaciones con dependencias Gubernamentales que cuentan con aviones susceptibles de ser acondicioados en aeronaves cisterna y con helicòpteros, que buscaremos al igual que los nuestros, su equipamiento para utilizarlos en posteriores campañas, de incendios forestales. Esto sin menoscabo de que, en la medida de nuestras posibilidades financieras, continuaremos, la renta de aviones cisterna con cargo a los presupuestos federales y estatales para las regiones donde han probado su utilidad.

Por otro lado en los incendios ocurridos en Quintana Roo en la presente temporada se tuvo la necesidad de utilizar algunos equipos y sistemas nunca antes empleados en el combate de incendios forestales, lo cual tambièn nos permitiò probar y en algunos casos confiramar su valla o inoperancia. Es asi como se utilizò equipo aèreo con sistente en: dos aviones fumigadores de 600 lts., de capacidad cuya efectividad fue muy limitada tanto por la baja capacidad de carga como por el tamaño de los incendios; dos avionetas, una CESSNA 206 y otra CESSNA 310 para detecciòn de incendios; 2 aviones especializados para la estimulaciòn de lluvia, los cuales tambièn tuvieron resultados no tan satisfactorios como se esperaba; un aviòn cisterna "Dromedario" de 2,000 lts. de capacidad de carga, que fue adquirido por el Gobierno del Estado para el combate de incendios en la zona; asi como 9 helicòpteros, 4 Bell 212 y 5 volco.

Con uno de estos helicòpteros se pudo utilizar uno de los tres helibaldes ("Brckets") que el Servicio Forestal de Geogia, E.U.A., nos facilitò en 1988, a travès de las gestiones que realizò el Servicio Forestal de E.U.A., con lo cual se pudo constatar la versatilidad y mayor utilidad de los helicòpteros para el combate de los incendios forestales, cuando estos cuentan con equipo adicional.

Debido a la dimensiòn y ubicaciòn de los incendios en Quintana Roo se utilizò, de manera masiva, maquinaria pesada para el combate de incendios forestales, lo cual tampoco habia ocurrido en Mèxico, asi como una gran cantidad de herramientas y quipo que tambièn probaron su utilidad en estas tareas.

En este apartado tambièn cabe destacar las acciones realizadas para la incorporaciòn de herramienta manual y equipo especializado para el combate de incendios forestales, cuyo uso es cada vez màs amplio en Mèxico con resultados satisfactorios, por lo que a fin de ampliar el uso de dichas herramientas y equipos y en virtud de que en Mèxico es difìcil conseguirlos, se ha solicitado formalmente apoyo a la Sra. Joan S. Wallace, Administradora de la Oficina de Desarrollo y Cooperaciòn Internacional **(COICD)** del Departamento de Agricultura de Estados Unidos de Amèrica, para la adquisiciòn de herramienta manual, equipo

especializado y prendas de protección personal para el combate de incendios forestales, tanto para contar con más y mejores recursos en Quintana Roo, como para otras regiones donde creemos la próxima temporada podrá ser crítica.

4. Cooperación Internacional.

Entre los avances registrados en México en materia de incendios destacan los encuadrados en el **Memorándum de Entendimiento con el Gobierno de E.U.A.**, así en 1988 se desarrollaron las siguientes actividades:

1.- en lo que respecta a **asistencia técnica**, entre febrero y marzo de 1989, tuvimos la visita de Jim Hickman, Director de Incendios y de Aviación de la Región Suroeste y de Alberto Matínez, Oficial de Manejo de Incendios de Canjilón, Nuevo México, ambos pertenecientes al Servicio Forestal de E.U.A., que trabajaron 15 días en el área boscosa del sur de la Ciudad de México, para proponer mejoras en la planificación y organización del combate de incendios forestales que se realiza en esa zona, las cuales a partir de esta campaña empezaron a instrumentarse con resultados altamente satisfactorios, como lo demuestra el hecho de que es la entidad federativa con el indicador de superficie por incendio más baja en todo el país.

2.- En la pasada temporada continuò operàndose el **Convenio de Cooperaciòn Mutua entre Sonora, Mèxico y Arizona, E.U.A.**, para la prevenciòn, detecciòn y combate de incendios forestales a lo largo de la zona fronteriza de ambos estados, el cual ha permitido atender de manera conjunta y oportuna los siniestros que ocurre en dicha zona.

En este aÑo ademàs de la consolidaciòn operativa de este convenio y como resultado de la revisiòn del mismo por parte de las autoridades de ambos paìses, se ha propuesto su ampliaciòn para otras actividades en materia forestal, asì como para otros estados fronterizos.

3.- Dentro del **Memoràndum de Entendimiento con E.U.A.** y con el apoyo del Sr. Pat Ebarb del Servicio Forestal de Texas, se recibiò como prèstamo indefinido al servicio forestal de Mèxico, un equipo de mayor potencia del Sistema de Bombeo Expansivo de Agua (WEPS) el cual en forma conjunta con el otro equipo que se nos habìa faacilitado, esta siendo probado por las brigadas de combate de incendios forestales en el Distrito Federal.

4.- En el proyecto de **"Uso de helicòpteros en el cambate de incendios forestales"** en el que se pretendìa entrenar pilotos mexicanos para al utilizaciòn de helibaldes (Buckets) en el combate de incendios forestales, queremos

informar que aûn cuando el Sr. Jim Hickman realizò todos los arreglos para contar con instructores de E.U.A. en la imparticiòn de este curso en Mèxico, esto no pudo ser posible debido a que los helicòpteros de la S.A.R.H., que se utilizarìan en el curso, no estuvieron disponibles ante la gran cantidad de misiones que se tuvieron que cubrir en este año.

Con respecto a los otros proyectos propuestos a desarrollar para 1989, dentro del Memoràndum de Entendimiento con E.U.A., tampoco rueron posible realizarlos ante la escases de recursos por parte de Mèxico, sin embargo agradecerìamos se tomaran en cuenta por parte del Servicio forestal de E.U.A. para reprogramarlos en el año pròximo.

Como un acuerdo de la pasada reuniòn del Grupo, para que los integrantes del mismo ayudaran en la realizaciòn de la **Conferencia Internacional de Incendios Forestales**, queremos informar que Mèxico, en la medida de sus posibilidades econòmicas, auxilió en la organizaciòn del evento, asi como en la difusiòn del mismo, tanto en Amèrica Latina como en Mèxico, para lograr la asistencia y participaciòn de los encargados de la protecciòn contra incendios forestales de diversas agencias, lo cual creemos fue cumplido con entera satisfacciòn sobre todo en Mèxico, en virtud de la nutrida asistencia de la delegaciòn mexicana a la Conferencia.

La participaciòn de la S.A.R.H., en esta Conferencia representò una experiencia invaluable, ya que no sòlo se pudo intercambiar informaciòn con otros paises y agencias del mundo, encargadas de la atenciòn del problema de los incendios forestales, sino que tambièn nos permitiò expresar nuestros puntos de vista y obtener ideas sobre la orientaciòn y politicas que debemos adoptar en el futuro para realizar nuestras tareas con mayor èxito, por lo que aprovechamos èste foro de la COFAN para hacer patente nuestro agradecimiento y reconocimiento a los patrocinadores y organizadores de la Conferencia, por la oportunidad de trabajar en forma conjunta con ellos en la realizaciòn de la misma.

Tambièn, dentro de la cooperaciòn internacional, es importante mencionar que desde principio de año se solicitò apoyo a otras agencias para la protecciòn y restauraciòn de la zona afectada por el Huracàn Gilberto en Quintana Roo, entre los que destacan:

A travès de nuestra representaciòn ante al **Comunidad Econòmica Europea** se gestionò el apoyo con asistencia tècnica y recursos, para lo cual fue enviado a la zona, un experto forestal de Dinamarca para identificar proyectos y oportunidades que pudieran ser financiados por la CEE., de lo cual estamos en espera de una respuesta oficial.

En este mismo sentido se ha solicitado la autorización de un Proyecto de Cooperación Técnica, por parte de la **FAO** para la prevención y combate de incendios forestales en la zona norte de Quintana Roo, el cual esperamos pueda ser autorizado y pueda ejecutarse a finales de este año.

En cuanto al Memorándum de Entendimiento para la Cooperación en Materia Forestal entre México y el Gobierno de Canada, y dentro del cual se considera el proyecto "Las técnicas de prevención y combate de incendios forestales", éste sólo se ha trabajado en términos de intercambio de información, principalmente en lo que respecta a la contratación de aviones cisterna con el Ministerio de Transportes de **Quebec, Canadá.** Es nuestro propósito encontrar mecanismos que permitan salvar las limitantes presupuestarias del Gobierno Mexicano para concretizar y fortalecer el intercambio con Canadá en la lucha contra los incendios forestales.

También dentro de la cooperación internacional, continúa el acercamiento de relaciones con algunos otros países, entre los que destaca **España**, en donde a través del Instituto Nacional de Conservación de la Naturaleza, apoyó a nuestro país para que tres técnicos mexicanos asistieran a un curso de Combate de Incendios Forestales que se realiza en este mes de octubre en aquel país.

Como quedò de manifiesto en la **Conferencia Internacional de Incendios Forestales, realizada en Boston, Mass., E.U.A.**, en julio pasado, el Servicio Forestal de Mèxico està convencido de que uno de los medios imprescindibles para avanzar en la atenciòn de este grave problema que es comùn para los paises de la regiòn del Norte de Amèrica, lo constituye **la cooperaciòn e intercambio internacional**, por lo cual nuestro pais esta dispuesto a continuar realizando esfuerzos para lograr que los proyectos que surjan de esta ayuda mutua se materialicen y den resultados positivos.

Servicio Forestal Mexicano

Cancùn, Quintana Roo.

Octubre de 1989

ANEXO: 2

INFORME DE LOS INCENDIOS FORESTALES

EN EL NORTE DE QUINTANA ROO, MEXICO

CC. Participantes a la 23a. Reunión del Grupo de Incendios de la Comisión Forestal de América del Norte (COFAN); por este conducto, me es muy honroso saludarles y darles la más cordial y fraternal de las bienvenidas, México da un paso más en la busqueda de mejores opciones para erradicar una amenaza para los bosques y selvas de todo el mundo, los incendios forestales, México se engalana hoy por encabezar tan hermosa labor, que nos une con nuestros hermanos de América del Norte.

Unidos, estamos seguros de lograr el objetivo.

México les brinda hospitalidad en este su más joven Estado Quintana Roo. reciban pues un mensaje de paz y fraternidad.

Bienvenidos a México.

Quintana Roo, el Estado màs joven de la republica mexicana, cuenta con una extensiòn territorial de 5'843,000 Ha. de estas, se considera, que el 82% son de vocaciòn forestal. El 40% de esta superficie tiene arbolado comercial, para distintas actividades del ramo, considerando a la caoba **(Swietenia Macrophylla)** y al Cedro **(Cedrela Mexicana)** como maderas preciosas, y de las aproximadamente 300 especies denomidads "Corrientes Tropicales", 16 son las mayormente aprovechadas dada la tècnologia con que se cuenta para su transformaciòn.

Las Explotaciones forestales inmoderadas, similares a las de una mina, sin tomar en cuenta que es un recurso renovable, traen consigo un empobrecimiento de las especies de mayor valor comercial y como es del conocimiento de la mayorìa de los habitantes del estado este fuè sometido a explotaciones desde èpocas muy remotas, intensificàndose en la època colonial y màs a principios de este siglo, con la llegada de inmigrantes extranjeros de diversos paìses, tanto Europeos, Centroamericanos y del Caribe. En ese tiempo se instalaròn grandes compañias extranjeras principalemnte Inglesas, las cuales ademàs de explotar las maderas preciosas, promevieron la extracciòn del latex del chicozapote **(Manilkara zapota)**, con esto se marcò toda una època de deterioro de nuestras selvas, tanto por las manos del hombre como por los incendios forestales.

Hoy en dia existen diversos testimonios de los grandes volûmenes de madera preciosa que se extrajeron de nuestras selvas, hoy se menciona como recuerdo de la abundancia o riqueza forestal que existiò en el pasado; pero no vamos a ser pesimistas, hoy tambièn conocemos la forma de restaurar nuestros bosques y selvas y para esa Hermosa Labor, ya estamos preparados.

Por estos tiempos se creo la primera ley forestal, la cual sin embargo, no considerò varios aspectos para mantener el equilibrio ecològico de nuestros bosques y selvas, actualmente contamos desde 1986, con su versiòn màs moderna en la cual señala desde su primer articulo, disposiciones del òrden pûblico e interès social, teniendo por objeto restaurar, ordenar y regular la conservaciòn y protecciòn de los recursos forestales.

Con una gran voluntad politica, el Gobierno del Estado y la Secretaria de Agricultura y Recursos Hidràulicos, con las experiencias obtenidas en los incendios pasados, ha tenido como premisa inicial: crear una plena conciencia en los direfentes estratos sociales, de la necesidad de proteger el recurso, logrando hasta la fecha disminuir la destrucciòn de la selva, tanto por los taladores furtivos como de los incendios forestales.

Con plena modernizaciòn en la administraciòn pûblica, se han instrumentado diferentes proyectos forestales, que actualmente se llevan a cabo en la Secretaria de Agricultura y Recursos Hidràulicos a travès de su delegaciòn estatal,

dada la importancia que reviste para la entidad el haber sido señalada en México como "Punta de Lanza" para diferentes actividades forestales, que entre otras tiene la campaña de divulgación para la prevención y combate de incendios forestales, así mismo tiene el proyecto de la concientización, la cual se enfoca entre otras actividades al público en general y con especial referancia a la niñez mexicana a fin de que sea el "Eje Moderador del Mañana" para darle un mejor manejo al recurso forestal.

Existe plena confianza en la conservación y restauracuón de nuestras selvas en el estado, tomando en cuenta la organización que para este rubro poseemos un ejemplo de esfuerzos que han hecho posible esta solida confianza es la estrecha relación que existe con los países participantes a la 23a. Reunión del Grupo de Incendios de la Comisión Forestal de América del Norte, la COFAN.

Tengan todos a bien, integrantes de la COFAN, y demás personalidades que nos acompañan, una calurosa y fraternal bienvenida a nuestro País que es México y en particular a nuestro bello Estado que es Quintana Roo.

El 14 de septiembre de 1988, la zona norte del estado de Quintana Roo, se vió seriamente afectada con la presencia del Huracán "Gilberto" fenomeno natural que a su paso daño un área apróximada a 1'000,000 de hectáreas, de las 5'843,000 con que cuenta el estado. Esta superficie afectada representa para el estado un volúmen de 24,000 m3, rollo de maderas preciosas, Caoba **(Swietenia macrophylla)**, Cedro

(Cedrela mexicana); y un volûmen de 1'074,000 m3, rollo de otras especies corrientes tropicales duras y blandas, siendo las mejor aprovechadas: Chechem Blanco **(Sebastiana longicuspis)**, Chacte **(Swietenia panamensis)**, Chaca **(Bursera simaruba)** Tzalam **(Lysiloma bahamenis)**, Jobo **(Spomdias nonbin)**, Granadillo **(Platimiscium yucatanum)**, Jabìn **(Piscidia comunis)**, Chicozapote **(Manilkara zapota)**, estas especies son las que presentan mayor grado de comercializaciòn y de una industria muy importante en el desarrollo del estado. Como consecuencia de los fuertes vientos huracanados que llegaron a alcanzar hasta 340 kilometros por hora resultò un gran potencial de material combustible de alto riesgo y con ello la incidente amenaza de los incendios forestales para las temporadas 1989 y 1990, no obstante las precauciones tomadas por el Gobierno del Estado y la Secretaria de Agricultura y Recursos Hiràulicos, para prevenir los siniestros.

Estos se hicieron presentes desde el principio de la temporada de quemas tradicionales con fines agropecuarios que prevalecen en la regiòn, calendarizado desde el mes de marzo al mes de julio.

La zona norte del Estado queda comprendida dentro de la jurisdicciòn del distrito de desarrollo rural integral No. 003 dependiente de la Delegaciòn Estatal de la Secretaria de Agricultura y Recursos Hidràulicos, con base en Cancùn, Quintana Roo.

El área afectada en esta zona esta constituida en su mayoria por selva baja, selva mediana subperenifolia y subcaducifolia, cuenta en menor escala con sabanas y vegetación arbustiva, el terreno plano relativamente rocoso presenta abundantes oquedades cubiertas de materia orgánica provenientes del mismo follaje, lo cual propició que el comportamiento del fuego fuese en ocasiones subterráneo, bajo y rastrero.

En el mes de febrero del presente año, se presentaron los primeros incencios, mismos que fueron combatidos por el personal de la Secretaría de Agricultura y Recursos Hidráulicos. En el mes de abril dió inicio la etapa crítica, a partir del mes de mayo se presentaron diversos brotes de incendios, los que fueron incrementandose a mayor escala debido a las condiciones extremas del clima (altas temperaturas 30 C, fuertes vientos 10 a 20 kilometros por hora y humedad relativa muy baja).

Dichos incendios fueron atendidos por el personal destinado por la Secretaría de Agricultura y Recursos Hidráulicos para la campaña de prevención y combate de incendios forestales en el presente año, a medida de que la temporada de incendios avanzaba considerablemente y dada la cantidad de material combustible seco existente (bejucos,hojarasca, árboles y arbustos derribados), tuvimos en distintas partes de la zona afectada, mayor cantidad de brotes de incendios; por este motivo se hizó necesario de manera urgente una

mayor cantidad de recursos humanos, materiales y financieros para el control de estos siniestros.

Durante el mes de junio se combatiò arduamente con los recursos con que se contaban, 200 elementos entre personal de la S.A.R.H., y ejidatarios campesinos del lugar, dada la extensiòn territorial que abarco la zona afectada (1'000,000 hectàreas) y el aumento de brotes, se hizò necesario contar con mayor nûmero de tractores tipo "bulldozer" y equipo aèreo, principalmente para el reconocimiento, ubicaciòn y planteamiento de estrategias para el combate. Como es de entenderse, ante la magnitud del problema, los requerimientos de recursos cada dia fueron en aumento y la situaciòn fuè agravàndose, de tal manera, que con fecha 14 de julio del año en curso los CC. Secretarios de Agricultura y Recuros Hidràulicos y de Desarrollo Urbano y Ecologia se reunieron con el C. Gobernador Constitucional del Estado de Quintana Roo, a fin de establecer un programa coordinado con la Secretaria de la Defensa Nacional y de la Marina asi como del propio Gobierno del Estado, Municipios y diferentes sectores, que ya con anterioridad venian participando.

Cabe mencionar que previo a los incendios se obtuvo apoyo de la Comunidad Internacional, se recibiò la colaboraciòn de tècnicos de Canadà, Estados Unidos y de la Comunidad Econòmica Europea, quienes en conjunto con el personal de la Secretaria de Agriculturay Recursos Hidràulicos, evaluaron la problematica y diseñaron una estrategia para la prevenciòn y el combate de los incendios en la regiòn,

denominado **"Plan General para el combate de incendios forestales en la zona norte del estado de Quintana Roo".** En consecuencia la Secretaria de Agricultura y Recursos Hidràulicos otorgò màs recursos, se contrataron 117 personas para actividades de prevenciòn y combate de incendios, se llevò a cabo una campaña de difusiòn para orientar a la poblaciòn en general sobre el particular, se autorizaròn transferencias presupuestales relativas, en la medida en que se fueron presentando los diferentes brotes de incendios. A partir del dia 20 de julio, el operativo diò inicio en base a la estragegia definida, para lo cual se dividieron tres zonas de trabajo: la zona norte comprendida por los frentes de incendios de Isla Mujere, Rancho Viejo, Ramonal, Francisco May y Leona Vicario; la zona centro definida por los incendios de Alfredo V. Bonfil-Torres, Alfredo V.Bonfil-Pozos, Flamingos Mayab, Vallarta Norte y Vallarta sur y por ùltimo la zona Sur donde se ubicaban los incendios de Playa del Carmen, Puerto Aventuras, Cinco Hemanos y un incendio de menores proporciones localizado en el ejido Hèroes de Nacozari.

Asi mismo, la Subsecretaria Forestal Realizò los tramites para que fueran enviados como apoyo once tècnicos especialistas en el combate de incendios forestales; tres de la Direcciòn de Proteccion, dos de la Delegaciòn de la Secretaria de Agricultura y Recursos Hidràulicos del Distrito Federal, y uno de cada una de las Delegaciones de la misma Secretaria de Chiapas, Queretaro, Michoacan,

Jalisco, Tabasco y Veracruz. De manera colateral a lo anterior y como parte fundamental para la puesta en marcha del nuevo operativo, la Secretaria de la Defensa Nacional, asignò 1,400 efecivos para apoyar al combate de los siniestros, de igual forma la Secretaria de Marina trasladò 1,200 elementos a las zonas afectadas.

En el combate de dichos siniestros fueron incorporandose cada vez màs elementos hasta llegar a 4,000 personas asignadas, contando con la colaboraciòn de las siguientes dependencias: Secretaria de la Defensa Nacional., Secretaria de Marina, Secretaria de Agricultura y Recursos Hidraulicos, Secretaria de Desarrollo Urbano y Ecologia, Gobierno del Estado a travès de las Secretarias de Obras Pùblicas y Desarrollo Urbano, Secretaria de Fomento Agropecuario, Comisiòn de Agua Potable y Alcantarillado, Comisiòn Estatal de Caminos, Sistema Mecànizado de Apoyo Rural, Instituto de la Vivienda del Estado, Ayuntamiento Benito Juàrez, Conasupo, Canaco, Canirac y Hoteleros de Cancùn, C.T.M. y C.R.O.C, Transportistas, Voluntarios de los Ejidos Leona Vicario, Puerto Morelos y la Zona Maya (Municipio de Felipe Carrillo Puerto y Josè Maria Morelos), Petròleos Mexicanos, Aeropuertos y Servicios Auxiliares, La S.C.T., C.F.E. y FONATUR, Gobierno del Estado de Yucatan, Secretaria de Programaciòn y Presupuesto, y Secretaria de Gobernaciòn. Destacamos el valioso y eficaz apoyo brindado por el Ejercito y la Armada Nacional.

En estos trabajos se conto con 17 tractores tipo "bulldozer", 9 helicòpteros, uno de ellos equipado con helibalde, un avion con el que se "Bombardearon" las nubes tipo "Comulus Limbus" con yoduro de plata para estimular la precipitaciòn pluvial (Lluvia), un aviòn dromedario, diez pipas, 120 bombas apersoras, 45 motosierras, ocho camiones de volteo, 65 vehìculos de diferentes tipos y 20 aparatos de radio portatil.

Se abrieron 400 kilometros aproximàdamente de guardarrayas, de 10 a 25 metros de ancho, con maquinaria pesada y 150 kilòmetros de brecha corta-fuego con herramienta manual.

Por la magnitud que tomò el fenòmeno y su impacto en al opiniòn pùblica, la Secretarìa de Agricultura y Recursos Hidràulicos, solicitò a la Procuraduria de la Repùblica, la investigaciòn de los hechos, para determinar presuntas acciones intencionales y las responsabilidades correspondientes.

Una vez establecido lo anterior y haber redefino los apoyos de la maquinaria, apoyo logìstico, equipo aèreo, las diferentes coordinaciones interinstitucionales y de los diferentes sectores participantes, los resultados por si mismos se fueron dando, aunado a ello y para nuestra fortuna el dìa 29 de julio se presentaron fuertes chubascos intermitentes ocasionados por un meteoro que se encontraba formàndose en el Mar Caribe, estos fuertes chubascos vinieron oportunamente para apoyar el avance de las acciones realizadas, mismas que para entonces se estimaba en un 70%

del total del control de todos los siniestros, esto significò menos trabajo y desgaste de recursos, asi como menor afectaciòn en la vegetaciòn. A pesar de ello los trabajos de brecheo, liquidaciòn, reconocimiento y evaluaciòn, continuaron desarrolandose.

A principios del mes se logrò liquidar casi en su totalidad a los incendios, quedando sòlo algunas fumarolas de insignificantes consecuencias, porque ya se habia presentado plena la temporada de lluvias, llegando asi al final de una etapa que sin lugar a dudas nos dejò, a un alto costo, una muy grande experiencia que nos llevarà seguramente a garantizar la restauraciòn y preservaciòn de los recuros forestales.

Vale la pena mencionar que el control de los indendios forestales es una actividad dificil y compleja, inclusive, todos los dias en la prensa, la radio y la televisiòn, nos mencionan los siniestros ecològicos ocasionados por el efecto del fuego, incluso en los paises desarrollados se han ocasionado incendios similares al pasado en la zona norte de Quintana Roo, tenemos por ejemplo el incendio forestal del Parque Nacional de Yellowstone, California, ocurrido el año pasado y que afecto una superficie de màs de 200 mil hectàreas; y el actual incendio del Bosque Nacional Boisse, Idaho que afecto 20 mil hectàreas, despuès de dos meses que llevan tratando de controlarlo, asi como el reciente incendio de Manitoba, Canadà, que por su magnitud dio lugar a la evacuaciòn de 40 mil personas de diversos poblados.

Esto explica la razon por la cual a pesar de los repetidos requerimientos que le hicimos a varios Gobiernos Estatales de los Estado Unidos, inclusive al Servicio Forestal de Washington y también al Canadà, no fue posible obtener aviones sisterna en arrendamiento.

De manera preliminar se estiman dañadas 119 mil hectàreas con diferente intensidad.

Actualmente se realiza una evaluaciòn detallada de la superficie dañada, a fin de conocer con precisiòn los daños causados y favorecer la regeneraciòn y recuperaciòn del ecosistema.

Por esto, la delegaciòn S.A.R.H., en coordinaciòn con la Secretarìa de Desarrollo Urbano y Ecologìa, ha formulado un programa de reforestaciòn que abàrcaba una superficie aproximada de 11,923 hectàreas con 3'294,900 plantas de comprobada adaptaciòn a la regiòn, tales como: Cedro, Pich, Chacà, Jabin, Ramòn, Chicozapote Ciricote, Izalam y Pasa'ak, poniendo a la consideraciòn de la Comisiòn Forestal de Amèrica del Norte, validar y hacer ajustes en caso que lo considere necesario.

Por lo tanto, la acciòn de los incendios en la selva requiere de un programa integral de restauraciòn ecològica que contemple: Investigaciòn y experimentaciòn orientada al conocimiento de los procesos de selecciòn, regeneraciòn y en general los biològicos de la selva; establecimiento y operaciòn de criaderos de fauna silvestre nativa de la zona ya sean particulares, como estatales o federales,

reforestaciòn por especies silvestres naturales en las zonas criticas, para acelerar el proceso natural de regeneraciòn de la selva, y mejorarla reintroduciendo especies comercialmente demandadas de interès local y comercial industrial.

El programa de prevenciòn, detecciòn y control de incendios, debe seguir siendo prioridad de los niveles de Gobierno Federal, Estatal y Municipal y de la Sociedad en su conjunto coordinado con la Secretaria de Agricultura y Recursos Hidràulicos, el **Programa de Restauraciòn de la Selva** debe ser una prioridad de los tres niveles de Gobierno y de la Comunidad Internacional, por la relevancia que tiene este tipo de selva del tròpico humedo como patrimonio de la humanidad, para conservar la calidad ambiental que resulta indispensable.

El area mayor y màs afectada se localiza al poniente (oeste) de Cancùn, una superficie aproximadamente de 75 mil hectàreas, comprendiendo en su mayoria los Municipios de: Isla Mujeres, Benito Juàrez, en menos escala Terrenos Nacionales y al Ejido Leona Vicario.

Hacia el sur el fuego se manifestò en un gran nùmero de lugares destacando por su tamaño el existente en los terrenos del Ejido Playa del Carmen y Akumal con una extensiòn aproximada de 15,000 hectàreas; entre estas dos grandes àreas de fuego se localizan, màs al oeste, Paralelo a Puerto Aventuras, dos àreas màs, cada una de ellas de 9,000 hectàreas aproximadas. Las otras àreas menores de

fuego se localizan dispersas en los ejidos de Felipe Carrillo Puerto y Lazaro Cardenas, sumando en conjunto 19,000 hectàreas aproximadamente, al parecer el fuego llevò un efecto diferencial que se debiò a varios factores fundamentales:

- La existencia de materia orgànica combustible producida por los efectos del huracàn.
- La velocidad y derecciòn del viento, las altas temperaturas (30 C) y el estiaje que actuò diferencialmente segùn fuese la humedad del suelo.

Estos factores conjugados produjeron la diversidad de daños que por razones de clasificaciòn agrupamos en tres tipos de àreas.

Severamente dañadas: donde la cubierta vegetal fuè totalmente calcinada y los suelos desquebrajados.

Areas medianamente dañadas: donde aùn existen numerosas especies arbòreas en pie,pero donde la vegetaciòn arbustiva y el material orgànico proveniente del follaje y de los troncos derribados por el huracàn fueron consumidos por el fuego, siendo este tipo de àrea predominante en las 119 mil hectàreas afectadas.

Areas levemente afectadas, donde el fuego actuo sobre la superficie coronaria foliar, sin destruir totalmente la corteza de los àrboles.

Dado que las especies existentes en el àrea estàn adaptadas a los litosoles y caracteristicas climàticas de esta parte de la Peninsula, una vez que ceso la acciòn del fuego, se

inicio la aparicion de brotes vegetativos, lo que indica que esta forma de regeneracion es la principal en este tipo de situaciones.

El fuego afecto principalemnte areas cubiertas por monte y selva baja, cuyo componente arboreo es de 150 arboles por hectarea mayores de 10 centimentros de diametro del tallo y tres mil arboles por hectarea entre 5 y 10 centimetros de diametro del tallo, la mayoria de las especies duras y blandas "Corrientes Tropicales".

La distorsion del regimen de lluvias segun datos historicos ocurre despues de un huracan.

Inferimos que la fauna de invertebrados y la fauna del suelo (hormigas, gusanos y larvas) por sus caracteristicas de movilizacion lenta, resulto muy afectada.

Todavia no se sabe suficientemente si los animales que pudieron movilizarse fuera del area incendiada sufren presiones por sus requerimientos de habitat y la capacidad de carga del area siniestrada.

Dado que el repoblamiento faunistico depende del restablecimiento de la cubierta vegetal, este sera un proceso mas favorable.

Se considera que la avifauna no fue afectada severamente debido a que su desplazamiento le permitio sobrevivir, perdiendo, lamentablemente, a sus juveniles y a sus crias.

RECOMENDACIONES.

Debido al riesgo de incendios forestales en la regiòn afectada por el huracàn Gilbero en el Estado, se recomiendan las siguientes actividades que pueden ayudar para dar una atenciòn mejor y oportuna a los siniestros.

ACTIVIDADES SIGUIENTES A LA CAMPANA 1989.

1. EVALUACION.

Se deberàn valorar con exactitud las hectàreas afectadas, tipo vegetaciòn afectada, costos econòmicos, valor ecològico de las àreas siniestradas, etc. para lo cual serà necesario considerar alguna de las alternativas siguientes:

A) Levantamiento de aerofotogràfico de la zona jurisdiccional al Distrito de Desarrollo Rural con el cual se podria calcular con exactitud parte de los daños señalados anteriormente.

B) Utilizaciòn de los mapas del INEGI, para cuantificaciòn de superficies.

2. REHABILITACION.

A) Mediante la evaluaciòn antes prevista se podria decidir a que àreas deberàn dàrsele atenciòn de rehabilitaciòn en lo que incluye actividades de reforestaciòn.

3. PREPARACION DE LA CAMPANA 1990.

- Actividades de prevenciòn.

Utilizaciòn de los medios masivos de comunicaciòn (Prensa, Radio y Televisiòn) haciendo ènfasis en los daños que los

siniestros ocasionaron y los gastos que se requirieron para su control y extinciòn, se deberà dirigir el mensaje tratando de dar alternativas del mejor uso del fuego cerca de las àreas forestales atendiendo a las causas que dan origen a los mismos mencionando la aplicaciòn de la ley para aquellas personas que sean sorprendidas provocando incendios.

Se sugiere la conveniencia de elaborar material de difusiòn en maya para que llegue al campo donde estàn los problemas.

- En los recorridos de campo del personal del Distrito se deberà hablar con los ejidos y comunidades respecto a la prevenciòn en los incendios, asi como hacer llegar el material de difusiòn con mensajes en codigos y lenguje local que para tal efecto se reproduzca en la Delegaciòn de la S.A.R.H., como son carteles, folletos, tripticos, etc.

- En los recorridos se deberà hacer labor de consientizaciòn con la gente para que en la medida de las posibilidades se formen grupos voluntarios para la atenciòn de los siniestros en las pròximas temporadas.

- Participaciòn institucional y del sector social y privado. Antes de que inicie la campaña se deberà contactar con cualquier otra instancia Federal, Estatal o Municipal a fin de prever los apoyos necesarios para una atenciòn oportuna y eficiente para los incendios forestales. Para ello es recomendable la creaciòn del Comitè Estatal de Prevenciòn y

Combate de Incendios Forestales, en el cual se asignan responsabilidades y recursos por aportar por cada parte, como ejemplo:

SARH	Recursos humanos, materiales y financieros.
SEDENA	Recursos humanos y equipo aèreo.
GOBIERNO DEL ESTADO	Recursos financieros y materiales.
PRESIDENCIAS MUNICIPALES	Recursos Financieros y materiales.
INDUSTRIA FORESTAL	Recursos humanos, materiales y finacieros.
INDUSTRIA HOTELERA	Recursos financieros.
PEMEX	Apoyo con equipo aèreo.
SCT	Apoyo con personal.
SOCIEDAD CIVIL DE EJIDOS FORESTALES	Apoyo con personal.
CONASUPO	Despensas
CONACO	Despensas
LICONSA	Despensas
ASA	Comandancia del aeropuerto, apoyo en operaciones aèreas y detenciòn de incendios.

PGR	Apoyo con elicòpteros y en la averiguaciòn para deslindar responsabilidades de posibles incendiarios.

Es importante establecer los compromisos claros y bien definidos a travès de un convenio donde todas las partes firmen y exista la participaciòn del C. Gobernador como testigo de honor.

PRACTICAS DE CAMPO.

QUEMAS CONTROLADAS.

Conforme a la situaciòn de causas que originan los incendios forestales, hacer un programa de quemas controladas que comprenda los meses de noviembre, diciembre y enero en aquellas àreas que presentes un peligro potencial, por ejemplo las carreteras Cancùn-Tulum, Cancùn-Valladolid, etc. y dentro de la selva en àreas cercanas a los centros de poblaciòn y campamentos de constructores, asì como en las àreas con alta acumulaciòn de combustible.

-LIMPIA DE MONTE EN AREAS CRITICAS.

Limpia de las brechas ya realizadas, así como la apertura de nuevas brechas de manera planificada para aprovechamiento forestal y de manera conjunta con fines proteccionistas contra los incendios.

- CAPACITACION Y ADIESTRAMIENTO.

Es indispensable la capacitación del personal participante en la actividad de incendios forestales dado la peligrosidad que representa esta actividad para la seguridad de los combatientes, así como una forma para eficientar acciones.
Para lo anterior, existen instructores nacionales que pueden apoyar la ejecución de un curso a nivel estatal o regional, únicamente haciendo la solicitud ante la Delegación Estatal de la Secretaría de Agricultura y Recursos Hidráulicos correspondiente y/o Oficinas Centrales (Dirección General de Protección Forestal).

Las mismas personas que han participado en la extinciòn de los incendios (personal forâneo), tienen la capacidad de formar parte del cuerpo de instructores que pudieran impartir el curso de referencia.

- ASPECTOS TECNOLOGICOS.

Por la situaciòn especial del combate de los incendios en la selva, se requiere contar con un equipo mìnimo indispensable para combatirlo, destacando:

1. Utilizaciòn del equipo aèreo-helicòpteros, para reconocimiento, construcciòn de helipistas, transporte de personal, herramientas, agua, alimentos y equipo menor cerca de la linea de control.

El uso del equipo "rappell" o del "winch" con helicòpteros para atacar incendios pequeños o para construir helipistas, es en este tipo de incendios, parte fundamental en la estrategia de ataque, se deberà considerar este tipo de equipo.

El apoyo con descargas de agua con el "helibalde" y el aviòn cisterna adquirido, deberà contemplarse cuando los incendios son incipientes.

Si se requiere el arrendamiento de aviones cisterna del tipo CL-215 los cuales son òptimos para incendios como los que se presentaron en esta temporada.

Otros equipos de utilidad son las motobombas portàtiles mochilas apersoras, retardantes quìmicos, antorchas de

goteo, tanques portatiles y herramienta hecha especialmente para el combate de incendios (fabricaciòn nacional).

Por otra parte tambièn se deberà prever la disponibilidad de maquinaria pesada para apoyar las labores de los combatientes.

- RECOMENDACIONES GENERALES.

. Contar con una organizaciòn anticipada para las acciones de combate de incendios forestales, con responsabilidades y nombramientos definidos.

. Atacar la presencia de incendios desde su inicio tratando que estos no tomen magnitudes mayores, un ejemplo de como se deben hacer las cosas, es lo realizado en Sian Kan, donde los diez pequeños incendios surgidos fueron atacados con oportunidad, logrando con ello una menor afectaciòn al recurso y por otra parte minimizar los costos del combate dado que en otras condiciones se hubiese tenido que recurrir a un gasto mayor para su control y extinciòn.

. El trabajo de incendios forestales requiere personal directivo y operativo, las 24 horas del dia, y es precisamente en los fines de semana cuando hay que estar màs alerta, por la presencia de nuevos brotes que puedan surgir.

. Por las propias condiciones de la selva y de los suelos existentes en la zona, el comportamiento de los incenidos generalmente va a ser de tipo superficial y subterràneo, por lo que la estrategia general a seguir serà la apertura de brechas a mano o con tractor a una distancia prudente de la linea de fuego, la aplicaciòn de quemas de ensanche, la

vigilancia como parte importante y la liquidaciòn de los mismos.

. Se hace necesario tener una bodega especial para la prevenciòn y combate de incendios forestales,por cada uno de los Distritos de Desarrollo Rural, pero màs especialmente para el Distrito de Desarrollo Rural No. 003 con sede en Cancùn, donde haya disponibilidad de equipo, herramienta, accesorios, etc. en el momento que asì sean requeridos.

. Ya en la temporada de incendios forestales, deberà existir un lugar especial que sirva como centro de operaciones, planificaciòn de estrategias, reuniones, etc. con espacio suficiente para lograr el mejor desarrollo de los planes.

. **IMPORTANTE.**- El uso de la radiocomunicaciòn en el combate de incendios forestales, representa en ocasiones el 40% de eficiencia, si este equipo no existe se opera a unicamente un 60%, se requiere de hacer un estudio detallado para la implementaciòn de una red de radiocomunicaciòn que incluya radios base, repetidor, radios mòviles y el equipo portatil necesario para el buen funcionamiento de los operativos a realizar.

Todo lo anterior, redundarà en mejores resultados operativos y un gran apoyo para la seguridad del personal combatiente.

. **DETECCION.**

La detecciòn vìa aèrea es fundamental en esta zona, por lo cual se requiere continuar con los vuelos de reconocimiento diarios, hasta que no se declare el periodo de lluvias. A mediano plazo se deberà prever la avioneta de la Secretaria

de Agricultura y Recursos Hidràulicos para detecciòn durante la temporada de incendios.

. Establecimiento de Infraestructura.

Considerado que en la actualidad no existe nigùn campamento contra incendios forestales en el estado, se hace necesario iniciar de manera paulatina la construcciòn de campamentos contra incendios forestales donde se asigne personal, vehiculos de doble traciòn, herramientas, equipo de radiocomunicaciòn, etc., bajo la responsabilidad de un àrea determinada, establecidos estrategicamente de acuerdo a la problemàtica de incendios en la entidad.

. Seguridad Personal.

Un aspecto de principal relevancia es que el personal combatiente pueda efectuar sus labores, bajo un porcentaje alto de seguridad, por lo cual se hace necesario que el personal encargaado de la actividad de incendios forestales lleve el equipo nìnimo de protecciòn personal, el cual incluye, camisa y pantalon de algodòn (no tela sintètica), botas, casco, guantes de carnaza, cantimplora y botiquìn individual de primeros auxilios.

Compromisos a cumplir en la pròxima temporada de incendios forestales.

- Dar cumplimiento en lo posible a las actividades plasmadas y presupuestadas en el programa de prevenciòn y combate de incendios forestales, en el àrea afectada por el huracàn "Gilberto" al norte del estado de Quintana Roo, propuesto para 1990 por la Delegaciòn Estatal de la Secretaria de

Agricultura y Recursos Hidraulicos. (se anexa programa y presupuesto).

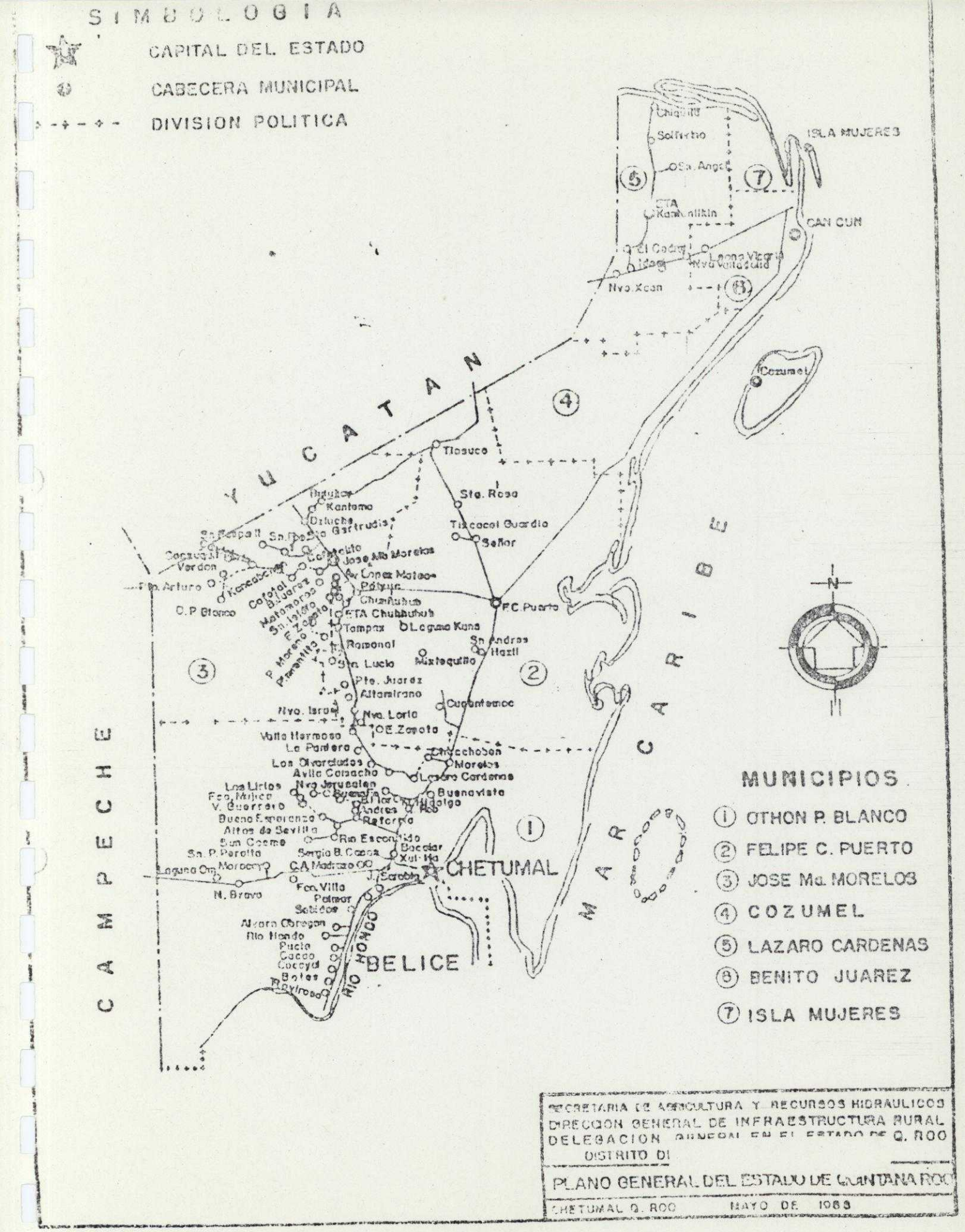
- Realizar las actividades correspondientes a la recoleccion de germoplasma y prácticas previas a la germinación de especies nativas y deseadas para la zona de interés, mismas que han de llevarse a cabo en los viveros establecidos.
- Llevar a cabo el programa de reforestación propuesto por la Secretaria de Agricultura y Recursos Hidráulicos, mismo que fue programado para 1990, sin embargo ya se dió inicio para la zona afectada por los incendios forestales. (se anexa el programa de reforestación).

Por último y a manera de espedida el personal comisionado por la Subsecretaria Forestal para participar muy honrosamente en esta 23a. Reunión del Grupo de incendios de la Comisión Forestal de América del Norte,queremos dejar patente nuestro agradecimiento por la atneción prestada y por las facilidades otorgadas y a otorgar, de la consecución del programa de extinción de los incendios forestales en la zona norte del estado de Quintana Roo, aclarando que los planteamientos aqui señalados, son sugerencias que pueden tomarse y ponerse a consideración, para mejorar la actividad de protección contra los incendios forestales, favoreciendo asi la preservación y restauración de la selva Quintanaroense, que es factor importante para conservar el ecosistema, para el País y para la Humanidad del mundo entero.

DE LA ZONA NORTE, DE QUINTANA ROO, MEXICO.

ESTIMACION DEFINITIVA POR MUNICIPIO

DESCRIPCION MUNICIPAL.	SUPERFICIE AFECTADA (HA)
LAZARO CARDENAS.	
SABANAS EL EDEN Y TRES MARIAS	9,403
ZONA NACOZARI	200
	9,603
ISLA MUJERES.	
ZONA AGROPECUARIA FRANCISCO MAY. RAMONAL, RANCHO VIEJO, SABANAS DE LAGUNA CHAKMOCHUIL	29,286
BENITO JUAREZ	
ZONA DE CAPTACION HASTA ZONA URBANA AL NORTE DE LA CARRETERA CANCUN VALLADOLID	19,361
EJ.LEONA VICARIO SAN FRANCISCO	654
EJ.LEONA VICARIO LUIS ECHEVERRIA	150
ZONA TORRES ELECTRICAS AL NORTE DEL AEROPUERTO	7,412
ZONA DE POZOS 1a.ETAPA AL OESTE DEL AEROPUERTO	3,605
ZONA DE PEQUEMAS PROPIEDADES AL SUR DE LOS POZOS AEREOPUERTO 1a. ETAPA	350
ZONA FLAMINGOS	4,578
EJ.PUERTO MORELOS (CENTRAL VALLARTA)	20
ZONA CLORO	20
	43,310
COZUMEL.	
RANCHO LOS 5 HERMANOS	1,935
EJIDO PLAYA DEL CARMEN	13,485
ZONA DE PUERTO AVENTURAS	21,514
ZONA A 22.0 KMS. AL OESTE DE PUERTO AVENTURAS	100
	37,034
SUPERFICIE TOTAL APROXIMADA PERIMETRAL	119,233


SIMBOLOGIA
CAPITAL DEL ESTADO
CABECERA MUNICIPAL
DIVISION POLITICA
ISLA MUJERES
CAN CUN
Cozumel
YUCATAN
CAMPECHE
MAR CARIBE
BELICE
RIO HONDO
CHETUMAL
F.C. Puerto
Tihosuco
Ste. Rosa
Tixcacal Guardia
Señor
Mixtequilla
Cuauhtemoc
Morelos
Lazaro Cardenas
Buenavista
Hidalgo
Reforma
Rio Escondido
Bacalar
Xul-Ha
Sergio B. Cano
C.A. Madrazo
J. Sarabia
Felipe Villa
Palmar
Sabidos
Alvaro Obregon
Rio Hondo
Pucte
Cacao
Cocoyol
Botes
Ribera
Nvo. Xcan
Nvo. Loria
Pto. Juarez
Altamirano
Ramonal
Tampax
Laguna Kana
Hazil
Sn. Andres
Sn. Lucio
Valle Hermoso
La Pantera
Los Divorciados
Avila Camacho
Nva. Jerusalen
Los Lirios
Fco. Mujica
V. Guerrero
Buena Esperanza
Altos de Sevilla
San Cosme
Sn. P. Peralta
Morocoy
Laguna Om
N. Bravo
Chacchoben
Kantemo
Gertrudis
Jose Ma. Morelos
Pabellon
Chunhuhub
ETA Chunhuhub
Cocoyol Verde
Fco. Arturo
O.P. Blanco
Cafetal
Juarez
Matamoros
Sn. Isidro
F. Zapata
P. Moreno
Pirantilla
Ocho Zapata
Nva. Israel
Chiquilá
Solferino
Sn. Angel
ETA Kanxoldzilkin
El Cedro
Idolo
Nva. Voluntad
Laguna Verde
Nva. Xcan
Sta. Cruz
Sta. Gertrudis
Sn. Pablo
Sn. Rafael
Kancabchen
Chacchoben
Nva. Loria
O.E. Zapata
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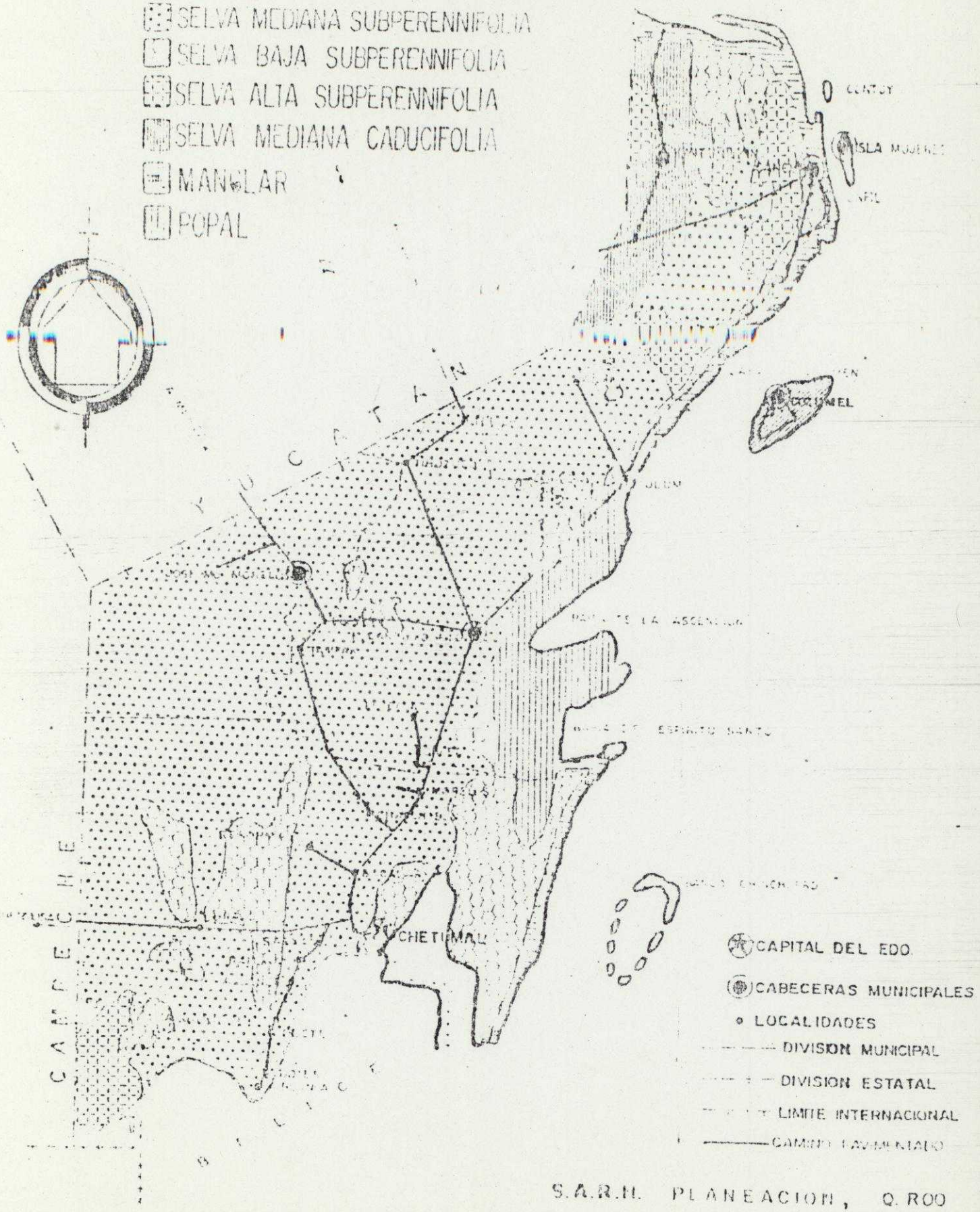
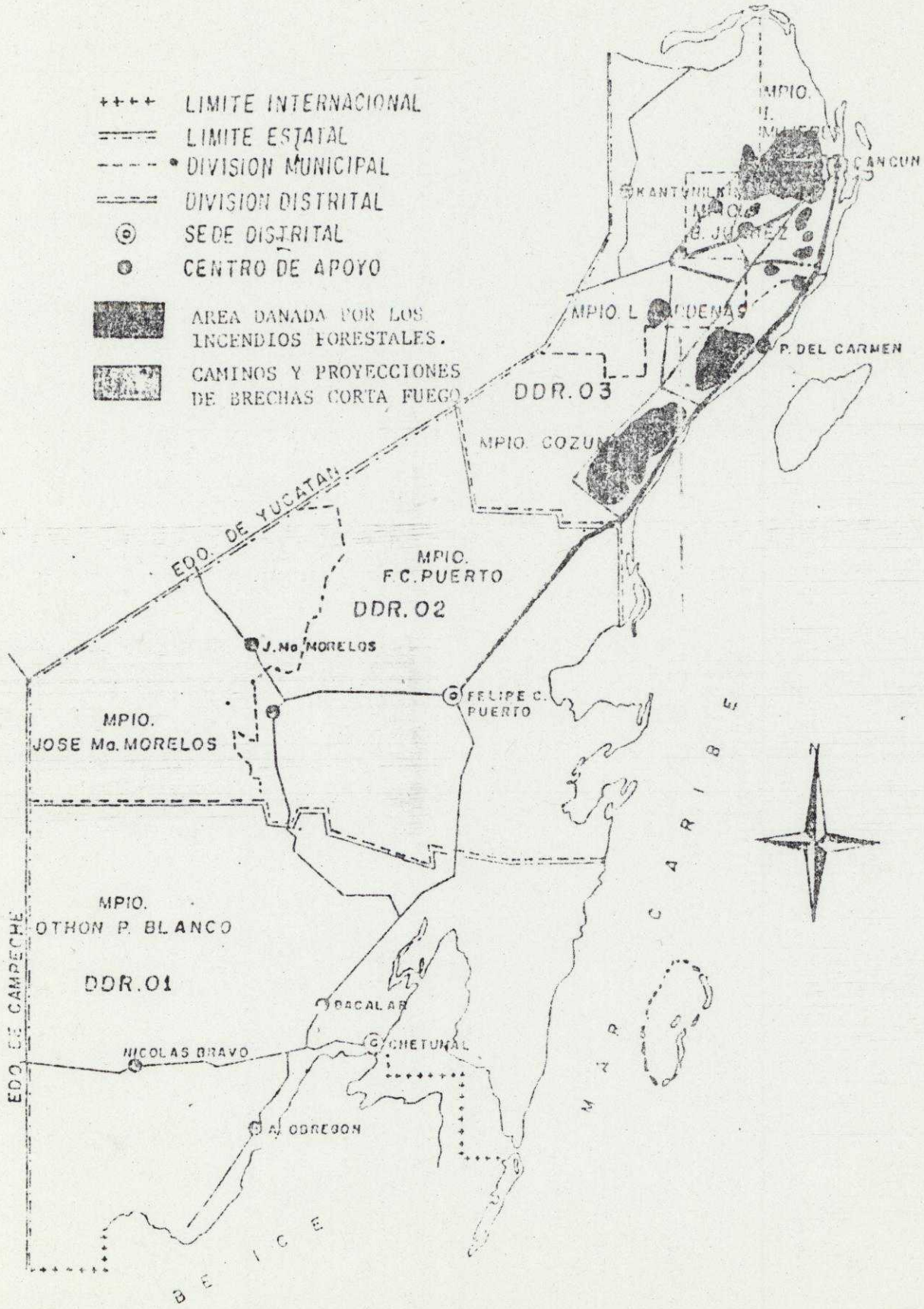
Sabidos
Alvaro Obregon
Rio Hondo
Pucte
Cacao
Cocoyol
Botes
Ribera
N
MUNICIPIOS
1 OTHON P. BLANCO
2 FELIPE C. PUERTO
3 JOSE Ma. MORELOS
4 COZUMEL
5 LAZARO CARDENAS
6 BENITO JUAREZ
7 ISLA MUJERES
SECRETARIA DE AGRICULTURA Y RECURSOS HIDRAULICOS
DIRECCION GENERAL DE INFRAESTRUCTURA RURAL
DELEGACION GENERAL EN EL ESTADO DE Q. ROO
DISTRITO DI
PLANO GENERAL DEL ESTADO DE QUINTANA ROO
CHETUMAL Q. ROO
MAYO DE 1983

ESTADO DE QUINTANA ROO
RECURSOS FORESTALES



S.A.R.H. PLANEACION, Q. ROO

DELIMITACION DE INCENDIOS FORESTALES EN EL
DISTRITO DE DESARROLLO RURAL No. 003.
ESTADO DE QUINTANA ROO.



PLANEACION SEPT 87

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