

The Management of India's Wild Life Sanctuaries and National Parks

BY

E. P. GEE, M.A., C.M.Z.S.

PART IV

(With two black-and-white plates)

[Continued from Vol. 54 (1) : 21]

CONTENTS

	PAGE
INTRODUCTION .. .. .	.. 453
A PRELIMINARY NOTE ON TERMINOLOGY .. .. .	.. 454
RECOMMENDATIONS OF THE INDIAN BOARD FOR WILD LIFE ON WILD LIFE SANCTUARIES .. .. .	.. 458
RECOMMENDATIONS OF THE INDIAN BOARD FOR WILD LIFE ON NATIONAL PARKS .. .. .	.. 460
STANDARDS FOR NATIONAL PARKS IN INDIA: A STATEMENT OF NATIONAL PARK POLICY .. .. .	.. 463
FOREST FIRES AND WILD LIFE .. .. .	.. 466
MOVING RARE SPECIES TO ALTERNATIVE LOCALITIES .. .. .	.. 470
FOREST DEPARTMENT PLANTATIONS WITHIN SANCTUARIES (AND NATIONAL PARKS) .. .. .	.. 474
THE HOLDING OF WILD LIFE PHOTOGRAPHIC EXHIBITIONS .. .. .	.. 476
PROCEDURE IN REPORTING CASES OF POACHING, BOMBING OF FISH, ETC. .. .. .	.. 477
INFORMATION TABLES FOR SANCTUARIES, NATIONAL PARKS, ETC. .. .. .	.. 480
REFERENCES .. .. .	.. 485

INTRODUCTION

This paper forms the fourth and concluding part of the series. Part I having appeared in the Society's *Journal*, Vol. 51, No. 1 (December 1952), Part II in Vol. 52, No. 4 (April 1955), and Part III in Vol. 54, No. 1 (December 1956).

Since writing the last paper, the writer has visited Europe twice, the United States of America and Canada once, and many places throughout the subcontinent of India—many of these for the second or third time—in order to study wild life management and in order to see the conditions prevailing in national parks and sanctuaries.

A PRELIMINARY NOTE ON TERMINOLOGY

This note has been written in the hope that it will give publicity to the need for adopting a uniform, standard and correct terminology in sporting and conservation circles in India. It is, in fact, a tabulated statement of the relevant terms officially approved by the Indian Board for Wild Life during the last nine years, as far as possible in conformity with international practice.

Full understanding and wide acceptance of these terms and their meanings in India cannot but contribute to the good cause—the continuance of wild life both for the present and for future generations.

1. **GENERAL.** A sheet fact-finding survey to consider the various words used in India and other parts of the world relating to game, wild life and so on would not result in the answer that it is a mere academic quibble over slightly differing terms. Rather it would show that each of these words has its own definite meaning, and that each is used for an entirely different purpose.

There is, of course, no suggestion that the usage or interpretation of words by any single individual or organization should be forcibly thrust on others: rather it is a matter of necessity for a standard and uniform system of terminology to be adopted, to the advantage of all concerned.

In fact, it will be found that not only the serious wild life conservationist but also even the happy-go-lucky sportsman has to choose the right word even in ordinary conversation, if he is to avoid confusion in his own mind as well as in the minds of others! For apart from the fact that certain words have definite and distinct meanings, some words have come to be officially adopted by certain countries for specific purposes. In certain words, moreover, there has been a gradual evolutionary change in their meaning, or they have been discarded altogether.

2. **PROTECTION.** Take the word 'protection' for example. Correctly it means 'guarding and defending against danger and

injury'. Even recently it was somewhat loosely used by several organizations when they meant 'preservation'. For instance there was the International Union for the Protection of Nature. But objections were raised that 'protection' implies a total closing or locking up (of resources) so as to prevent use (of them). So the word 'protection' came to be dropped by this organization in favour of the word 'conservation', and I. U. P. N. became the International Union for the Conservation of Nature. The word 'protection' continues, of course, to be used: for example in India partial protection of certain species is done by closed seasons and restricted shooting. Total protection is done by sanctuaries or by legally prohibiting the killing or maiming of a particular species at any time and in any place.

In addition to the above, after the Indian Board for Wild Life made a recommendation dated February 1955 a 'protected area' is now officially recognised as 'an area constituted by an order of a State Government in India to give protection to wild life in places other than parks and sanctuaries. It refers chiefly to areas near River Valley Projects and other irrigation works, in and around large towns and sacred places'.

3. **PRESERVATION.** Preservation means 'saving or maintaining from injury or destruction; keeping safe and undisturbed for private and public use'. It is correctly used now by various societies in relation to game and wild life.

Incidentally a 'preserve' is 'ground set apart for protection of game or for shooting of game', and is generally used in India for the private (game) preserves of the former princes, if they still exist.

4. **CONSERVATION.** Originally 'conservation' meant 'preservation and preventing waste, a meaning which came to be associated with locking up resources and preventing their use'. Nowadays it has a broader meaning—'the effort to increase and sustain the supply of resources we now need and will continue to need for generations to come'. Briefly it could now be said to mean 'planned management and wise use of natural resources'.

5. **GAME.** There is still a lot of confusion about when the term 'game' or 'wild life' should be used. This is surprising because there is a very big difference between them! The term 'game' refers to 'those species of mammals, birds etc. which are hunted or shot either for trophies or for their meat or for sport, or for a combination of any of these'.

In pre-Independence days the sanctuaries of India were called 'game sanctuaries' because they were created by the former Provincial Governments to stop game animals from becoming extinct, and to keep the numbers of game animals at a high level—mainly for the benefit of sportsmen, for big and small game shooting. In those days the modern concepts of general nature conservation do not seem to have reached India.

In recent years, especially since the formation of the Indian Board for Wild Life in 1952, the distinction between 'game' (animals and birds which are shot by sportsmen) and 'wild life' (which embraces all wild animals, birds etc.) has been officially adopted. In a resolution at the Meeting of the Indian Board for Wild Life at New Delhi in February 1958 it was agreed 'that the term "game" should be replaced by the term "wild life" in all cases where conservation of nature was concerned. The term "game" should, however, continue to be used where sport or shooting legislation was concerned'.

In some of the smaller and very local newspapers one sometimes reads the absurd term 'games sanctuaries', which conjures up thoughts of wild animals playing badminton or football! Still more absurd, but with potentially interesting implications, was the statement of a Forest Bent Officer in western India who, when describing a jheel with water birds such as snipe, said 'In the old days British officers used to come here and play small games'!

6. WILD LIFE. The term 'wild life' includes all mammals, birds, reptiles etc. as opposed to 'game' which includes only those mammals, birds, etc. which are shot for trophy, meat or sport. This word is usually spelt 'wildlife' in the U.S.A. and Canada. Fishes are, of course, wild life, but are often not included in wild life management unless specified (cf. U.S. Fish and Wildlife Service). In India the policy of the Indian Board for Wild Life has been not to deal with fishes except when they happen to come within the management of sanctuaries and national parks.

Wild life in its widest possible sense would also include plant life, but at the inaugural session of the Indian Board for Wild Life in 1952 it was agreed that vegetation would not officially be included in 'wild life' except when it provides cover or food for mammals, birds, reptiles etc. But special provision was made for medicinal plants in the resolution: "Special "preservation plots" may be constituted where plants of medicinal value or species of special botanical interest may need to be preserved along with or without wild life'.

Incidentally, good wild life conservationists are not at all opposed to sportsmen or to shooting of game; they are only trying to stop the indiscriminate and often illegal slaughter of animals and birds, in order that there may be a sustained surplus for bona fide sportsmen to shoot legally—both now and in subsequent years.

'Wild life' is, of course, a collective noun, and singular. One is apt to shudder when one reads in small local newspapers the absurdly coined plural 'wild lives'!

7. **RESERVES.** In India a 'reserve' is '(reserved) forest, or an area in which wild life is protected, by being so constituted under the Indian Forest Act or other forest law'. Internationally, however, 'nature reserves' or 'natural reserves' are areas which can be of various special categories, and these have not been officially adopted in India. Most 'reserves' or reserved forests in India in which reasonable numbers of wild life are found have by now been up-graded into wild life sanctuaries.

8. **PROTECTED AREAS.** The term 'protected area' has been officially adopted by the Indian Board for Wild Life when in 1955 a resolution was passed: 'Protected Areas. In many States there may be areas where it may be considered expedient:

(i) to afford special protection to wild life, in order to enable species of wild life which are on the verge of extinction to re-establish themselves,

(ii) to afford protection to wild life attracted to water impounded in River Valley Projects and to other irrigation works,

(iii) to afford protection to wild life in and around large towns and sacred places.

Such areas may be constituted by an Order of the Government which may also lay down the degree of protection.'

It should be noted that the protection of wild life does not necessarily imply the protection of vermin. Those wild animals and birds etc. which are injurious to other animals, or to the long-term interests of man, can be kept under control, or even destroyed altogether in extreme cases, in certain places.

9. **WILD LIFE SANCTUARIES.** The term 'wild life sanctuary' in India is 'an area constituted by the competent authority in which killing, hunting, shooting or capturing of any species of bird or mammal is prohibited except by or under the control of the highest authority in the department responsible for the management

of the sanctuary'. In India a sanctuary is usually created by an Order or Gazette Notification of the State Government.

The weakness of a sanctuary in India is that it can be 'de-sanctuarised' merely by another Order or Gazette Notification of a State Government, as it is not safeguarded by any proper legislation. Many of the better wild life sanctuaries of India have by now been up-graded into national parks by the States concerned.

10. NATIONAL PARKS. The definition of a national park in India as defined by the Indian Board for Wild Life at its inaugural session in 1952 is: 'An area dedicated by statute for all time, to conserve the scenery and natural and historical objects of national significance, to conserve wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations, with such modifications as local conditions may demand.'

In most countries of the world a national park can only be created by the national, central or federal government of the country. But under the Constitution of India, 'wild life' is a State Subject and not a Concurrent or Central Subject, and therefore a State Government can constitute a national park in its State Legislature—preferably subject to certain standards which are now being drawn up by the Indian Board for Wild Life.

At the moment some States have created national parks, and some have not. Therefore a wild life sanctuary of one State need not necessarily be inferior to a national park of another State.

RECOMMENDATIONS OF THE INDIAN BOARD FOR WILD LIFE ON WILD LIFE SANCTUARIES

Various resolutions relating to wild life sanctuaries and national parks have been passed by the Indian Board for Wild Life and its Executive Committee at successive meetings from 1952 to 1961. These are to be found scattered here and there among resolutions on other subjects in the Proceedings of the nine meetings, and it has been considered advisable to extract them and publish them in a compact form in the order in which they were passed.

The relevant resolutions on wild life sanctuaries are as follows:

'The creation of wild life sanctuaries (or wild life refuges) of such size and in such numbers which the needs for the preservation of wild life, more particularly of the species which have become scarce or which are threatened with extinction, may demand.

"The expression "wild life sanctuary" shall denote an area constituted by the competent authority in which killing, hunting, shooting, or capturing of any species of bird or animal is prohibited except by or under the control of the highest authority in the department responsible for the management of the sanctuary. The boundaries and character of such a sanctuary will be kept sacrosanct as far as possible. Such sanctuaries should be made accessible to visitors.

"While the management of sanctuaries does not involve suspension or restriction of normal forest operations, it would be generally desirable to set apart an area of one to about twenty-five square miles within a sanctuary where such operations may not be carried out, to ensure the nursing up of wild life undisturbed by human activities. Such sacrosanct areas may be declared as *abhayaranya*, i.e. a forest where animals could roam without fear of man. Such a sanctuary within a sanctuary would also ensure the preservation of plant life unspoiled and undisturbed.

"In the management of sanctuaries, control should be exercised over elements adverse to the maintenance of wild life including destruction of vermin and predators. In the case of any difficulty, expert advice may be obtained from the Indian Board for Wild Life.

"In the event of a sanctuary being located in one State contiguous to a sanctuary in another State, the desirable co-ordination may be effected through the Indian Board for Wild Life.

"That buffer belts of sufficient width be declared around all sanctuaries within which no shooting, other than that required for legitimate crop protection, will be permitted and within which no professional graziers will be allowed to establish their cattle pens . . . and that State Governments be requested to inoculate systematically and periodically domestic cattle in the neighbourhood of national parks, sanctuaries and reserves where and when necessary."

(Inaugural Session, Mysore, 1952)

"Wild life sanctuaries are areas ordinarily set apart by an Order of the State Government for the purpose of preserving wild life. The management of such sanctuaries is adequately dealt with under Resolution 6: "Protection of Nature and Wild Life" of the Mysore Session of the Board held in 1952. The Board recommends that sanctuaries conforming to the standards laid down under Resolution 6 (b) of the Mysore Conference may be constituted as such.

"In many States there may be areas where it may be considered expedient:

- (i) to afford special protection to wild life, in order to enable

species of wild life which are on the verge of extinction to re-establish themselves,

(ii) to afford protection to wild life attracted to water impounded in river valley projects and to other irrigation works,

(iii) to afford protection to wild life in and around large towns and sacred places.

Such areas may be constituted by an Order of the Government which may also lay down the degree of protection.'

(Second Session, Calcutta, 1955)

'That the State Governments take suitable steps for providing sufficient food and cover to wild life in the sanctuaries.'

(Fourth Session, Ootacamund, 1961)

RECOMMENDATIONS OF THE INDIAN BOARD FOR WILD LIFE ON NATIONAL PARKS

There has been a slight but significant evolutionary change in the policy concerning legislation to be adopted for national parks in India. In 1952 and 1953 it was hoped that by a slight revision of Schedule VII of the Indian Constitution it would be possible to get national parks placed on List III (the Concurrent List). Later it was found that this was not possible, and so then became apparent the anomaly that national parks, essentially an all-India affair, were a State subject and would have to be created by Acts of the State Legislatures.

In order to ensure the national character of such parks and uniformity in the various States, it was then decided to draw up a Model Bill which would serve as a basis on which States could frame their own legislation for national parks. This model bill was circulated to all States for comment and suggested amendments, and was then vetted by the Law Ministry. In its finalised form it was sent to all States in February 1957.

The relevant resolutions on national parks in the Proceedings of the successive meetings of the Indian Board for Wild Life and its Executive Committee are as follows:

'The creation of national parks in conformity with the general objectives laid down by the International Union for the Conservation of Nature and affiliated bodies.

'Provided that should a State create a national park, the advice of the Indian Board for Wild Life will be taken to ensure its national character.

"The term "national park" for this purpose would generally denote "an area dedicated by statute for all time, to conserve the scenery and natural and historical objects of national significance, to conserve wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations, with such modifications as local conditions may demand".

(Inaugural Session, Mysore, 1952)

'It is also essential that there should be uniformity in the management of national parks and the standards to be maintained should be of a high order. The main reason for the non-establishment of national parks in the country is that the State Governments are not in a position to finance wholly by themselves the establishment of national parks. National parks, the establishment of which has been recommended separately, may not come into being without central advice and assistance from the centre. In the United States "national parks" is a federal subject and such parks are entirely financed and controlled by the Federal Government. The Central Government was contemplating amendment of the 7th Schedule of the Constitution (list of Union, State, and Concurrent Subjects) on the recommendation of the Commodity Controls Committee. Advantage of this fact should be taken and, therefore, recommends to the Central Government that the subject of "national parks" be added to List III (Concurrent List) in Schedule VII of the Constitution.'

(Executive Committee, Kanha, 1953)

'National parks are areas set apart by an Act of the competent Legislature for permanent preservation. Such areas may have for their objective the preservation of one or more of the following features: geological, pre-historical, historical, archaeological, scenic, faunal, and floral.

'It is not an essential condition of national parks that there should be no human intervention. Where it is desired to exclude human intervention altogether, it may be possible to set apart a suitable part within the national park—*sanctum sanctorum*—which may receive absolute protection.

'Such parks are not to be created lightly.

'In framing proposals for the constitution of national parks, the Board considers it desirable that State Governments should consult it and avail themselves of the technical knowledge and experience at its disposal.

'The Board recommends further that legislation to be enacted in various States for the creation and management of national parks should follow a common pattern. In order to facilitate this the Board will prepare and circulate a model draft bill.

'In order to ensure the national character of such parks, the Board recommends that in the authority set up under the legislation the Central Government and the Board be represented through the Inspector General of Forests or his nominee.'

(Second Session, Calcutta, 1955)

'The Executive Committee resolved to advise the State Governments that pending the constitution of any sanctuaries into national parks, any attempt that might be made to change their existing character or whittle away their resources in any way should be guarded against.

'The Committee also authorised the Secretary to examine the feasibility of suggesting to the State Governments the desirability of referring their National Parks Bills to the Centre before presentation to the State Legislatures.

'The Committee examined the draft Model Bill clause by clause and made a number of suggestions in the bill and requested the Inspector General of Forests to take into consideration the suggestions made and redraft the bill, also incorporating any suggestions that might be received from the members within the next 10 days. Thereafter, the bill was to be vetted by the Ministry of Law and circulated to State Governments.

(Regarding the point whether it would be desirable to call these parks 'national' as these parks were to be constituted by State Governments) 'the whole idea was to give a national character to the park. Some standards on a national level were to be laid down for all the parks even though they were to be constituted by the State Governments in different States. A national character could be secured by having the Central Government's representation on the Board of Management. Furthermore, there was a proposal to give some financial aid to the parks by the Government of India. It would therefore be in the fitness of things to call them national parks.'

(Executive Committee, Ootacamund, 1955)

'Model Bill for constitution of national parks which may be suitably adapted or added to, to provide for any special or local requirements. This Model Bill aims only at ensuring that the technical

requirements will be fully covered in any State legislation regarding "state parks". As will be seen, it is considered best that each park in a State should be so constituted by a separate Act of the State Legislature. It would follow that any alteration or alienation of the area of the park would also require sanction of the Legislature.

'As the bill provides exclusively for action by the State in respect of an area entirely within the State, these parks, it is considered, may be designated as "state parks". Where a State would elect to dedicate any park so constituted for use for national purposes and agree to the management and control of the park to be put on a national basis, such dedicated parks could be adopted as "national parks".'

(Central Government letter with model bill, February 1957)

'In keeping with international practice, the Committee decided that the national parks and sanctuaries should be kept open to visitors only from dawn to dusk.'

(Executive Committee, Shivpuri, 1959)

'The Board recommended that national parks may also be set up under the Acts of the State Legislatures, but before naming them as national parks the approval of the Board may be obtained. The Board will grant such approval only to such parks that will fulfil certain minimum requirements.'

(Fourth Session, Ootacamund, 1961)

STANDARDS FOR NATIONAL PARKS IN INDIA: A STATEMENT OF NATIONAL PARK POLICY

I. DEFINITION

National Parks are areas 'dedicated by statute for all time, to conserve the scenery and natural and historical objects of national significance, to conserve wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations, with such modifications as local conditions may demand'.

From this definition, passed at the Inaugural Session of the Indian Board for Wild Life in 1952, it follows:

1. That national parks must be areas of national significance to India as a whole, and of importance to the rest of the world, and not areas of mere local significance.

2. That the natural scenic beauty of the area must be carefully preserved so that it will remain unspoilt and unimpaired for the enjoyment of future generations. This means that there should be no forest operations such as the extraction of timber and planting of plantations in a national park, unless they can be justified on the basis of the very pressing economic needs of the country. In areas of outstanding beauty or holding valuable fauna, where it may not be possible to forego such forest operations (where they are already being done), the natural scenic beauty should be preserved as far as possible, and certain areas should be left strictly protected as 'inner sanctuaries' or *abhayaranya*.

3. That the existing and indigenous wild life of the area must be strictly preserved for the enjoyment of future generations. This implies that no 'foreign' or exotic species of fauna or flora should be introduced, though a species which once existed in the area and has within historical times become extinct can be re-introduced if an expert ecological study of the area favours such a step. A national park may preserve either rare and valuable species of fauna in danger of extinction, or typical fauna representative of the region, or a combination of both.

4. That development of the area must be carefully planned and executed so as to provide for its enjoyment by the public and by foreign visitors in such a way as to leave the natural scenic beauty and wild life unimpaired for future generations. This means that access roads should be made, and roads and paths inside the park for the use of visitors. And that rest houses and suitable accommodation should be provided. And that motor transport, riding elephants, boats and so forth be provided as local conditions may demand.

5. That national parks, wherever possible, must be of such size as to make them viable and ecological units, and comprehensive units embracing the amount of territory required for effective administration and for the continuance of the representative fauna and flora.

II. LEGISLATION

As wild life is a State subject, the legislation for the creation of parks will be enacted by the State Legislature concerned. It is considered advisable that there should be a separate Act of the State Legislature for each park, and not a general Act or an enabling Act for several parks. It is recommended that the model bill, as drawn up by the Indian Board for Wild Life and approved of by the Law

Ministry, should be used as a basis for any State legislation, in order to ensure uniformity and an all-India character in the parks of the country.

As the term 'national' has a country-wide, all-India significance, it is recommended to State Governments that the standards as laid down should be strictly adhered to, and that the approval of the Indian Board for Wild Life be obtained before designating a park as a national park. A park in a State can then be dedicated to the nation, and become a national park. Existing national parks in the country which are up to the standards laid down should remain as originally constituted.

III. ADMINISTRATION

In administering national parks it is recommended:

1. That for each national park, or for the national parks of each State, there should be a Management or Advisory Board or Committee consisting of members of the Government and Forest Department, eminent conservationists, representatives of public interests and so on. At any time considered desirable, the advice of the Indian Board for Wild Life should be sought.

2. That national parks be administered with the primary objective of conserving the scenic beauty and wild life in their natural state, and of preserving and safeguarding all objects within them. And that management, control, modifications and other such human intervention be done only under expert advice and in conformity with the standards as laid down.

3. That, wherever possible, buffer belts or buffer zones of sufficient width be constituted outside the boundaries of national parks, in order to ensure their inviolability—especially against poaching, grazing by domestic cattle, cattle-borne diseases, cutting of vegetation and so on.

4. That undesirable commercial activities and non-conforming recreational activities be avoided, as violations of the standards as laid down. Fishing with rod and line for sport, subject to local regulations, is permissible in national parks.

5. That carefully planned and restricted forest operations be permitted only when there are overriding reasons to justify them, such as the pressing economic need for timber and the revenue derived from it. In such cases steps must be taken to preserve the scenic beauty and to set aside preservation plots, inner sanctuaries or *abhayaranya*.

6. That roads and paths be constructed to enable visitors to see and enjoy the scenic beauty and wild life and for the purpose of administering and protecting the area, with the least interference with the natural scenery.

7. That buildings for accommodation of visitors and staff be constructed, but that they be as unobtrusive as possible and in harmony with their surroundings. While luxury for visitors is not recommended or desirable, there should be a high standard of the basic requirements of the present-day traveller.

8. That appropriate steps be taken to provide publicity to attract visitors from within the country and tourists from abroad. In addition, full information on each park should be available in the form of a well-illustrated booklet, which will be of use not only to visitors but also for educational purposes. The services of guides should be available, if required by foreign visitors. Picture postcards and other mementoes should be available for sale, if there is a demand for them.

9. That every step taken in the development and use of national parks conforms to the standards, so that the area may be left unimpaired for the enjoyment of future generations. If ever any doubt may arise, the ultimate interests of the people of the whole country and of future generations should be taken into account.

FOREST FIRES AND WILD LIFE

1. *General*

First of all, it is not possible to generalise on the subject or to formulate a forest fire-control policy which would be acceptable to all countries, or even to all regions in any one country. Only intensive studies conducted in each region, even in each individual reserved forest, sanctuary or national park could enable one to come to any definite policy decision for a particular place.

For instance, what might be the fire-control policy in certain forests or national parks of Canada may not be suitable for parts of Africa or India, where the local conditions of climate, environment and wild life are totally different.

Broadly speaking, it should be recognised that where such conditions exist that a forest fire could be very sudden, very widespread, and involving a very large area, then the fire hazard is very great and the potential loss to wild life, as well as to timber, very considerable.

2. United States and Canada

Such dangerous conditions exist in parts of the United States and Canada, that elaborate precautions are taken in parts of these two countries to fight fire. In some of the national parks of these two countries, where there are vast areas of pine forests, fire-control is done not so much to save the timber (for this is not exploited as a forest resource) but to prevent disfigurement of the park and to protect the wild life from destruction.

Here it should be mentioned that it is generally admitted by wild life conservationists in the United States and Canada (as well as in Africa and India) that: (i) nearly all wild life species 'are dependent upon habitats which have not reached the limit of floral succession, i.e. are sub-climax'; (ii) fire is one of the chief causes of a sub-climax vegetation; and (iii) grazing mammals require sub-climactic grasses and reeds, and browsing mammals need an adequate supply of broad-leaved trees and shrubs which are not often associated with a climax growth in some parts of the world.

Forest fires can be divided into two types: man-caused (either deliberate or accidental) and lightning-caused (natural). In the United States the official policy of the National Park Service is 'to reduce the number of man-caused fires to the smallest attainable minimum, and to combat any fire which occurs, regardless of size, origin, or location . . . Lightning causes few fires in eastern areas because the deciduous vegetation is usually green when lightning storms occur. In the western areas lightning and man-caused fires are of about equal occurrence.'

As the result of this policy a peculiar position has arisen in some of the national parks of the United States, for instance in Yellowstone. Many years of fire suppression have resulted in a considerable amount of dead and highly inflammable trees, branches and leaves lying on the ground all over the park. Thus, by suppressing all localised and small fires a situation has arisen in which, should a fire occur, it might become so serious and so widespread as to do far more damage at one time than would have been done by all the intermittent localised fires. There arose a controversy in Yellowstone as to whether lightning-caused, natural, localised fires should not, after all, be allowed to run their course as they have done since time immemorial, and as to whether complete fire-suppression is not actually an undesirable act of intervention by man in the course of nature.

3. *Africa*

Fire-suppression and controlled burning have been the subject of much discussion in many parts of Africa. Perhaps the most interesting case in this continent is the history of the controversy in the former Belgian Congo. For many years the Belgian Government practised the ideal of complete non-intervention, with a minimum of wild life management. As part of this policy, man-caused fires—and also lightning-caused fires—were rigidly suppressed, thus producing a climax type of vegetation quite unsuitable for the herbivorous animals which exist there in large numbers.

This was particularly so in the Parc National Albert, where through the centuries many of the antelopes and other mammals of the Rwindi Plain had become specialised for existence in and on sub-climax type of vegetation brought about by natural fires. It turned out that these were poorly adapted to the climax growth which followed the elimination of burning. Thus, to suppress fires altogether was not really a policy of non-intervention but was in fact an act of intervention by man. The Belgian authorities realised this, and reversed their policy and permitted fires to run their course in the Parc Albert—to the benefit of the wild life of that park.

In the Serengeti National Park of Tanganyika in East Africa an interesting case occurred where burning proved beneficial to wild life conservation. African villagers living outside the park boundaries in the region of Serengeti burned off some of their grazing areas in order to attract the park animals outside the park where they could shoot them. The Park Warden cleverly countered this move by burning off a large area within the park boundaries—with great success.

In South Africa controlled burning of the veldt has been done in order 'to improve' the grazing by destroying the dense high grass of the previous year. It has been found in the Kruger National Park, however, that 'the growth of the new and palatable shoots is soon checked, and in a short time the tender current growth on unburned veldt, while less conspicuous to the human eye, is considerably taller and probably more abundant'. Consequently an investigation was conducted to determine the facts. An ample area, however, was still being burned to provide material for study.

4. *India*

In this subcontinent most of the wild life is found in or near the reserved forests, which are generally protected against man-

caused and lightning-caused fires in order to conserve the timber. One method of fire-suppression is controlled burning of the highly inflammable grassy areas inside and around forests, often conducted in the early part of the dry season when the fire hazard is less. This 'cold burning' done in these grassy areas is undoubtedly essential for the existence of the herbivorous mammals, which thrive on the resultant sub-climax type of vegetation.

In Kaziranga Sanctuary of Assam, burning of the dense tall elephant-grass is done in patches each year, thus providing suitable areas of sub-climax grasses and reeds for grazing and also leaving areas of climax growth which provide necessary cover for the wild life of the sanctuary.

In Jaldapara Sanctuary of north Bengal controlled burning somehow came to be suspended for some years, resulting in a climax type of impenetrable vegetation unsuitable for the purpose for which the sanctuary was intended—the preservation of the Indian rhinoceros and other herbivorous wild life. This fault, I understand, has now been remedied and controlled burning has again been instituted.

An opinion was recently expressed by a Chief Conservator of Forests of a south India State that burning of forest areas reduces the numbers of certain undesirable insects, such as ticks. Probably some beneficial insects might also get destroyed, and this could be a subject of further research.

From a forestry point of view I understand that the natural regeneration of certain trees in India is actually benefited by controlled burning, while that of others is adversely affected. From the wild life standpoint, the burning of climax growth in patches and thus producing areas of sub-climax vegetation would be generally desirable—except when such burning occurred during the breeding season of birds and certain mammals.

A further benefit derived from the burning of climax grass and scrub undergrowth in national parks and sanctuaries is the improved visibility for the visitors who come to see wild life. As the economic or tourism value of wild life as a forest crop is very great, it is important to have open areas where herbivorous mammals, as well as their predators, can be seen and photographed by visitors.

5. Summary

Burning of vegetation, either man-caused or lightning-caused, can be destructive to wild life if uncontrolled or too widespread. On the other hand restricted and localised natural fires or controlled

burning, especially of tall dense grasses and undergrowth, will produce the sub-climax type of vegetation not only beneficial to but often essential for the existence of herbivorous mammals and other wild life.

Controlled burning of scrub and grassy areas in and around forests and sanctuaries, therefore, should continue to be practised in India whenever it is found, after careful study of local conditions, that it will be beneficial to wild life and not detrimental to other interests.

MOVING RARE SPECIES TO ALTERNATIVE LOCALITIES

It is the policy of the Indian Board for Wild Life to find suitable alternative homes in India for some of the rarer species. In the case of the Indian lion, for example, it was resolved at the Inaugural Session of the Board at Mysore in December 1952 that an additional locality be found for this species, *within its former range* and with suitable conditions of environment.

As a result of this resolution, it was subsequently proposed to move a few lions from the Gir Forest in north-west India into the Chakia Forest in Uttar Pradesh. This was not a case of introducing a new species into an area, but of re-introducing a species into a suitable locality within its former range and with suitable conditions of environment, which is in accordance with the accepted principles of present-day wild life management. (The reason why 'suitable conditions of environment' have to be searched for within the former range is that climatic and vegetative conditions in India have changed considerably in the last thousand years or so. Regions in the north-west, once green and fertile and holding such mammals as the rhino, have now become barren wastes.)

Subsequently, however, there has been a suggestion put forward that rare species from other parts of India be obtained for re-stocking sanctuaries which to some extent have become depleted of wild life by poaching. For example, it was once suggested that a few Indian rhino from north-east India be introduced into Periyar Sanctuary in Kerala; and that a few swamp deer from Uttar Pradesh, musk deer from Kashmir, brow-antlered deer from Manipur, and chinkara from north and central India could well be introduced into Mudumalai Sanctuary in Madras.

Now let us examine these suggestions. It is obvious that the musk deer, which is a species of very high altitudes near the snow line and which feeds on mosses, lichens, and such-like vegetation, would not thrive in Mudumalai. It is also, of course, doubtful if the

chinkara, which is an animal of dry and open regions, would thrive there. Therefore, musk deer and chinkara can be ruled out.

On the other hand it is possible that rhino, swamp deer, and brow-antlered deer would thrive in Mudumalai or Periyar, for these species do well in zoological gardens in other countries. But is it desirable to introduce these species as new species into these two sanctuaries which may become national parks in the near future?

The stated object of introducing new species into Mudumalai was that it 'will not only sustain the interest in wild life but also attract tourist traffic'. The object of introducing the rhino into Periyar was 'to make the sanctuary more popular with visitors and tourists'.

Thus, the objective in these two cases appeared not to be to provide suitable alternative homes for rare species so that they may stand more chance of survival. If this was the primary motive, then it could very strongly be argued that there are far more suitable 'alternative homes' for the swamp deer in central and north-east India, and for the rhino and brow-antlered deer in north and north-east India 'within their former range and with suitable conditions of environment'.

The real motive was to bring these species from north and north-east India with a view to attracting more visitors and tourists to their sanctuaries. Now, is this type of human intervention, i.e. introducing new species in order to attract more visitors, permissible in a wild life sanctuary or national park? Certainly not, by the present-day internationally accepted principles and standards of national park administration.

At the meeting of the Executive Committee of the Indian Board for Wild Life held at Periyar in January 1957 it was resolved that in such cases a thorough ecological study of the conditions both of the present home of a species (such as the Kaziranga home of the rhino) and also the proposed receiving sanctuary (possibly Periyar) should always precede any definite plans for such moves. This is a correct decision, but unfortunately it implies that if the ecological studies indicated that the species (say rhino) would thrive when moved from the supplying area (say Kaziranga) to the receiving area (say Periyar), then the introduction could take place. The resolution does not take into account the principles which govern national park administration and which do not permit the introduction of new species from outside.

Both Mudumalai and Periyar are valuable wild life sanctuaries with prospects of being created as national parks in the foreseeable

future. Now, the emphasis in the case of national parks and wild life sanctuaries is placed on conserving the *native* wild life, on preserving the *existing character* of the place, on preserving the *typical or representative fauna and flora* in an area maintained unspoilt for future generations. It is not permissible, according to internationally accepted principles and standards, to allow human intervention such as the introduction from outside of new species.

One of the most valuable and interesting facts about the Gir Forest is that it contains the Indian lion now living, as it did in former days and possibly since time immemorial, as a wild animal in its *natural* habitat. Similarly, Kaziranga houses the Indian rhino in its *natural* habitat, just as it probably did many thousands of years ago. The brow-antlered deer of Manipur live in their last marshy stronghold on the Logtak Lake—in their primeval *natural* habitat.

The fauna of south Indian sanctuaries, also, hold a similar unique position as being *truly representative* of the region in which they are found, having existed there from time immemorial. Now to put rhino from Kaziranga into Periyar, or brow-antlered deer from Manipur into Mudumalai, and so on, or conversely to put "bison" from Periyar into the Gir Forest, or chital from Mudumalai into Kaziranga would be a case of putting species into places where they have never formerly existed. Such an intervention would be tantamount to violating the *pristine integrity* and *natural sanctity* of these fine places. No longer would the original fauna be seen in its *natural and original habitat*, but a miscellany of wild animals from different parts of the sub-continent would be grouped together haphazardly, in the manner of zoological parks.

In any case the introduction of, say, a pair of rhino into Periyar would not solve the problem of how to provide more attraction to visitors—unless these creatures after importation were confined in an enclosure at the side of the lake and artificially fed by hand, as in a zoological park. For rhino are solitary beasts and great wanderers. They would probably not remain as a pair, but would wander far afield as individuals and would be rarely if ever seen by anyone—that is if they survived being shot by poachers or by cultivators in defence of their crops.

Similarly, the introduction of a pair, or even several pairs, of swamp deer into Mudumalai would not provide the answer to the problem. They would probably disperse and be rarely seen by visitors—even if the wild dogs were systematically reduced or exterminated beforehand. They would also probably fall very easy

victims to tiger and leopard, especially after capture, transportation and introduction into a strange and new habitat. Like the rhino, swamp deer and brow-antlered deer are great wanderers.

The same objections would apply to any proposal to re-introduce rhino into the Corbett National Park or into the Hazaribagh National Park, where they are believed to have once existed. If let loose into these parks, rhino would be sure to wander far afield into the cultivated areas and destroy the crops of villagers not accustomed to such beasts. Even if they survived the wrath of the villagers, any calves born would run a grave risk of being killed by tigers—rhino calves appear to be a favourite food of tigers in Kaziranga.

At this point it should perhaps be admitted that these three species could not so increase in numbers as to become a nuisance or harmful pest as in the case of the red deer in New Zealand and the reindeer in Alaska. The objection to the introduction of these three species from north and north-east India into south India would seem to be based on the fact that they would be a failure and therefore a waste of money, in addition to being a violation of the principle of not introducing new species into any area.

The two last-mentioned objections (failure and waste of money) would seem to apply to the recent proposal to introduce nilgai into Bandipur Sanctuary from some part of Madhya Pradesh. When the pair were placed in a ring fence near the sanctuary, even the cow could not be left in the same enclosure as the bull as the latter tried to kill his prospective mate. When turned loose into the sanctuary, it seemed probable that they would separate, and ultimately fall victims to tigers in this new habitat.

A further objection to such introductions is that 'there is evidence that parasites and diseases of introduced mammals are at least partly transferred with their hosts to new biota'.

If it is becoming increasingly difficult to find wild life in certain sanctuaries, and if it is required by the authorities administering these places that there should be more wild life for visitors to see, then surely the first and foremost thing to do is to reduce poaching and other illegal shooting both in the neighbourhood of the sanctuaries and also within the sanctuaries themselves.

Surely it would be advisable to preserve the integrity of these two potential national parks of Periyar and Mudumalai, and not to allow the high standards of wild life management adopted at the Mysore Session of the Indian Board for Wild Life to lapse into oblivion.

It is essential that these high standards be rigidly preserved. This subject has been thoroughly examined by other countries which have been studying the conservation of nature over a great number of years. May India not fail to profit from the experience of other countries, and may she continue to follow the highest standards of internationally accepted national park administration.

SUMMARY

Rare and vanishing species can be safeguarded by moving a few individuals to a new locality; but this new locality should, if possible, be *within the former range* and with suitable conditions of environment. Such a move should always be preceded by a careful ecological study of the conditions both of the supplying and of the receiving localities.

In sanctuaries and national parks where wild life has become depleted through poaching, the first step should always be to put an end to poaching and to re-habilitate the depleted wild life.

Introduction of new species into a new locality is usually a failure and a waste of money—unless accompanied by undesirable, expensive and artificial protective measures.

One of the internationally accepted standards of sanctuaries and national parks is that the *native wild life* should be conserved, and that no non-native species should be introduced. It is desirable that this standard should be maintained in India.

FOREST DEPARTMENT PLANTATIONS WITHIN SANCTUARIES (AND NATIONAL PARKS)

The definition of a national park in India as laid down by the Indian Board for Wild Life at its inaugural session at Mysore in 1952 is: 'An area dedicated . . . to conserve the scenery and natural . . . objects . . .' Therefore it would appear to follow that the planting of trees and shrubs in a sanctuary or national park should be avoided.

Also, one of the generally accepted principles of wild life conservation and management of national parks and sanctuaries is that the planting of trees within a sanctuary or park would amount to an act of human intervention or interference with nature which would be undesirable.

But in certain countries, such as India, where over-grazing by domestic cattle or excessive felling for timber and firewood has

resulted in the disappearance of vegetative cover and forests, it may be advisable—even desirable—to resort to afforestation. For in this case such afforestation or plantation work in a sanctuary might be necessary in order to remedy the much greater interference by man in the past, which has resulted in bare and arid conditions, soil erosion and so on.

If it is a case of felling existing uneconomical forest and replacing it with trees of commercial value, then each case would have to be judged on its own merits. If a State Government could justify the planting of such plantations in a sanctuary on the ground of pressing economic needs, this might take precedence over purely wild life considerations. But if such plantations can be avoided or if the plantations can be outside the sanctuary to serve as a buffer zone, this will be very much more desirable.

However, in doing any kind of afforestation or plantation work inside sanctuaries, the following points could well be observed in order to achieve the best results with the minimum amount of disturbance to the natural beauty of the place:

1. Plantations should as far as possible be on or near the edges of the sanctuary. This helps as a method of demarcation of the boundaries and as a protection against illegal incursion by cultivators, grazers and poachers. (This has been tried out with success at Laokhowa Sanctuary in Assam.)

2. Plantations should as far as possible (except in the case of those on the boundaries which would follow the direction of the boundaries) be irregular and natural-looking in shape. In other words they should avoid regular square and rectangular patterns and straight lines, so as to make the resultant artificially-produced forest later on appear to be a natural one.

3. The introduction of exotic species of trees and shrubs should be avoided. If those indigenous, local species which are most beneficial were to be planted, this would be very commendable.

4. If the plantations could be of mixed species, with a few trees which are beneficial to wild life—such as those with berries palatable to birds or suitable for their nesting, or with leaves palatable to herbivorous animals, and so on—this would assist in justifying the project.

THE HOLDING OF WILD LIFE PHOTOGRAPHIC EXHIBITIONS¹

1. The exact definition of the term 'wild life' should be given in the rules governing entries for the exhibition. If entomological and botanical subjects are to be included, this should be clearly stated; otherwise it might be assumed that the entries should include only mammals, birds, reptiles and fishes. Different sections can be arranged for each branch of wild life, if considered advisable.

2. The term 'wild life' should be further defined, so as to exclude all entries depicting captive or tame animals such as are found in zoos. Only photographs of genuine wild animals taken in a state of nature, i.e. in their wild state, should be entered. If required, a separate section or class can be made for photographs of animals which are captive or tame. Alternatively, the exhibition could be termed a 'natural history exhibition', and then photographs of captive or tame animals could be included—but in this case it should be clearly stated on both the entry forms and on the photographs that the subject was in captivity.

3. The panel of judges should comprise an odd number, preferably five; and these judges should have had ample experience of photographing the subject of the exhibition, namely wild life. Among the judges should be at least one person with sufficient knowledge of natural history to judge the biological merit of entries. (If wild life is to include entomological and botanical subjects, then an appropriate proportion of the judges should have had experience of this type of photography.)

4. In judging wild life photographs the following important points should always be looked for:

- (a) The main subject should be critically sharp.
- (b) Composition: the main subject should be nicely placed and lighted, and properly balanced.
- (c) At least some of the natural habitat should be shown.
- (d) There should be detail in both highlight and shadow.
- (e) The print should be nicely but plainly mounted, and any spots or dust marks carefully retouched so that they cannot be seen. Any particularly objectionable highlight should be toned down.
- (f) The picture should have natural history interest. Other things being equal, preference should be given to subjects of greater biological interest, such as pictures of rarer wild life, or wild life seen in interesting circumstances.

¹ My acknowledgements are due to Eric J. Hosking, F.R.P.S., and Lt.-Col. C. L. Boyle for help in compiling this section.

5. Marks for each entry might be given in the following proportion:

Technical and artistic excellence [Clause 4 (a) to (d)] 40%

Biological interest of subject and habitat [Clause 4 (f)] 40%

Presentation, mounting, touching, etc. [Clause 4 (e)] 20%

6. The judges themselves may submit photographs for the exhibition, but they should leave the room when their own entries come up for selection. Alternatively, a special section of the exhibition could be arranged to consist entirely of the work of the judges.

PROCEDURE IN REPORTING CASES OF POACHING, BOMBING OF FISH, ETC.

In many cases no action is taken by the authorities, to whom reports of poaching or bombing have been sent, owing to the fact that either insufficient data have been given or the report has been incorrectly submitted. The following note is intended to assist the would-be reporting members of the public in correct reporting and thereby assisting in preserving wild life and in ensuring a continuance of bona fide sport for the future.

1. How to report an incident

(i) It is necessary to give all possible information as to witnesses of the incident or malpractice, exact location, exact date, exact time and all available clues as to the identity of the alleged culprit (s).

(ii) It is necessary to submit the report as soon as possible after the incident or malpractice has occurred.

(iii) It is advisable to write the report in factual and correctly phrased language, as the report may be copied to others and referred to subsequently.

(iv) It is advisable to give reasons for reporting, e.g. *firstly* as a well-wisher of India desiring to co-operate with the authorities in the prevention of law breaking, *secondly* to preserve a fast-vanishing national asset from wanton destruction, and *thirdly* to ensure the continuance of sport for bona fide sportsmen who obey the laws and take out permits, licences, etc.

(v) It is advisable to request, in return for one's help in reporting, acknowledgement of the report. In some cases one could also ask for intimation in due course as to what action has been taken. Even better, personal contact could sometimes be established with the authorities in the matter. If no acknowledgement of a report is

received, a reminder should be sent with a copy to the next senior officer for information. If, after that, no reply is received a copy of the full report should be sent to the Head of the Department concerned, with covering letter. For this it is advisable to type extra copies of the report in the first instance.

2. To whom reports should be sent

In those States in which there is a separate Wild Life or Game Department, all reports should be sent to the Officer or Warden concerned. In States where there is no separate Department for Wild Life, this subject usually falls under two different administrative departments—the Forest Department and the Civil Authorities (Police).

(i) National Parks, Wild Life Sanctuaries, Game Reserves, Reserved Forest and so on come under the jurisdiction of the Forest Department. Reports of incidents or malpractices in these places should be sent to the Forest Officer in charge of the place. If Beat Officers (lowest in status) are omitted, the next higher officer is the Range Officer. Above him is the Divisional Forest Officer. Above him is the Conservator of the Circle. At the head of the Department is the Chief Conservator of Forests (in some States there are variations of this title). Above him is the Forest Minister.

(ii) Outside those places under the Forest Department as listed in No. (i), all places usually fall under the jurisdiction of the Civil Authorities and the Police. Therefore the report should be sent to the local Magistrate concerned, i.e. the Sub-Divisional Officer (or equivalent), the Deputy Commissioner (or Collector). Above these Officers is the Commissioner (in some States). Above him is the Chief Minister.

In North-east India there are additional administrative areas:

(i) North East Frontier Agency, containing four Frontier Divisions of Kameng Frontier Division, Siang Frontier Division, Luit Frontier Division and Tripa Frontier Division. Reports should be sent to the nearest officer of the Frontier Division concerned, either Forest or Civil—preferably the former. Above him is the Director of Forests, N.E.F.A., Shillong.

(ii) Naga Land. For offences in this State reports should be addressed to the Forest Officer, Naga Land, Manipur Road P.O. Above him is the Commissioner, Naga Land, Kohima P.O.

(iii) Hills Districts under VI Schedule in Assam. These Hills Districts are United North Cachar and Mikir Hills District, United

Khasi and Jaintia Hills District, Garo Hills District, Mizo Hills District, etc. Reports on offences in Reserved Forests in these Districts should be sent to the Divisional Forest Officer concerned. For offences outside the Reserved Forests in these Districts, reports should be addressed to the Forest Officer of the District Council concerned, or to the Chief Executive Member of that District Council.

3. Service Personnel

If Service Personnel are suspected of an offence, a report should be sent to the Commanding Officer of the Unit concerned (with a copy to the local Divisional Forest Officer). The Chiefs of Staff of the three Services have pledged their full support for the enforcement of the Game Laws, Shooting Rules, etc. among their personnel, who are bound to obey these in the same way as civilians are. Service personnel have no special rights or privileges with regard to shooting and fishing in Reserved Forests and elsewhere, and must take out permits and licences from the authorities in just the same way that civilians must do. In the case of Army Personnel, if no satisfaction is received from the Commanding Officer, a report may be sent to the Sub-Area or Area Commander, or in extreme cases to the Adjutant General's Branch of Chief of Army Staff, New Delhi. Reference may be made to Army Orders 214/56 and 593/57, and to the Notices published in Army Orders dated 24-12-55 and 25-8-56. In these Notices it is said that disciplinary action will be taken against personnel who offend the game laws of a State or for misuse of Government ammunition/explosives. In the Notice dated 25-8-56 the relevant extract from the Indian Fisheries Act, 1897, Section 4 (1), is reproduced: 'If any person uses any dynamite or other explosive substance in any water with intent thereby to catch or destroy any of the fish that may be therein, he shall be punishable with imprisonment for a term which may extend to two months, or with fine which may extend to two hundred rupees.'

4. Additional Recommendations

(i) It is recommended that a copy of a report be sent to any person who is closely concerned, for information only, if it is known that this will help matters.

(ii) If, in spite of correctly reporting a clear-cut case, no action is taken even when sent in the last instance to the Head of the Department, then the matter should be taken up with the Minister

concerned. Ultimately, if no action is taken, the matter should be reported to the Honorary Regional Secretary, of the Region concerned, Indian Board for Wild Life, or to the Secretary, Indian Board for Wild Life, Ministry of Agriculture, New Delhi. Publicity of the whole case may also be given in the Press, to invoke public support—for public opinion is by far the strongest ally of all in the fight against wanton destruction of a valuable national asset.

Many people, when they see or hear of poaching, bombing, etc. being done, are apt to become either angry (sometimes writing an irate letter to someone), or frustrated (sometimes taking no action at all). Such people usually say to themselves: 'What is the use of reporting? Nothing will be done about it. The authorities themselves have a hand in the racket!'

But if the above suggestions in correct reporting are fully followed by sportsmen, naturalists and other members of the public, it is certain that appropriate action will in most cases be taken, because all Government Departments are pledged to enforce the game laws etc. In most cases action will be taken by the first officer to whom the report is sent, and there should be no need for the subsequent suggested procedure.

If a member of the public remains silent and indifferent and does not report a case, he is to some extent acquiescing in the misdeed. If he does report, he is not only doing his duty as a good citizen but also he is actively contributing to the preservation of a valuable but fast-vanishing national asset.

INFORMATION TABLES FOR SANCTUARIES, NATIONAL PARKS, ETC.

Seasonal, climatic, sociological, ecological and other conditions vary so much even from place to place in the same country, that some system of tabulating information as to the times of the year when suitable conditions may be encountered for particular objectives becomes desirable.

Nearly everyone is familiar with the seasonal and climatic variations of the country, or at least the region, in which he has resided for some time. But a visitor from Europe or North America can be very little aware of the changing conditions from region to region of countries in Africa and Asia, and vice versa.

In many parts of Africa and Asia there are one or more rainy seasons during which some of the parks/reserves become quite inaccessible. These rainy seasons are often preceded by dry, hot and dusty periods, to be followed by spring-like or summer-like con-

ditions. Even if the seasonal and climatic conditions of a given region or country could be fully ascertained in advance, there are many other conditions which are not altogether dependent on seasons and climate, but which vary according to altitude, existence or otherwise of water, types of terrain and vegetation, migrations of certain species of wild life and so on.

For instance, in East Africa there are two short rainy seasons with varying rainfall in different parts of the country; and during these wet spells certain parks/reserves may be closed to the public. Is it not desirable to know beforehand exactly when these rainy seasons occur, and which parks are closed for which periods, and what the conditions are like immediately before and after these rainy spells?

Also in Ceylon there is a north-east monsoon and a south-west monsoon, but exactly when do these occur? It is reported that both the main parks of the country are closed during September—a month of not excessive rainfall. Information Tables, with index numbers 0 to 5, would appear to be most desirable in order to convey to intending visitors when they can best visit the parks of this country.

Also in India, as another example, it is essential that intending tourists and visitors should know that the Corbett Park is closed from June to October, and Kanha Park impossible to visit from the middle of July to the middle of November. At this very season, however, Dachigam and Shivpuri are at their best, and other places are well worth visiting during these months in India. In the case of India's bird sanctuaries it is essential to know that the breeding of water birds in Ranganthitoo is usually at its best in June, July and August; Keoladeo Ghana usually at its best in August, September and October; and Vedanthungal usually at its best in November, December, January and February.

Accordingly it is suggested that a Table be drawn up for each sanctuary/park/reserve, giving such general information as to show the months of the year in which visitors with varied interests can visit these places to their best advantage. Only by such means can visits be successfully planned by persons from far-away countries without frustration, disappointment and unnecessary expense.

At first sight it might appear that there would be a danger of too much crowding of visitors during the months which are shown on the Table to be the most suitable months for a visit. In actual experience, however, exactly the opposite is the result. For by studying the appropriate Table beforehand visitors would see at a

glance that certain months are more popular with the general public, and they themselves could avoid these rush months—especially if certain other months are favourable for particular objectives and individual interests.

For instance some national parks in South Africa are very crowded during certain school holiday periods. A careful study of Tables giving information about these parks would reveal that this crowded season could be avoided, with entirely satisfactory results. Again the crowded vacation season fills some of the national parks of North America during the months of July and August, while June and September are almost as good but very much less crowded and the best months for photography of wild animals in them are actually April and October.

Particular items can be shown in the Tables for persons with special interests, e.g. the flowering times of lower and higher altitude flowers, autumnal colours, best months for fishing in rivers and in lakes, best months for mountaineering and so on. As these times often differ from those which attract the greater holiday crowds, there would be a wider selection of months resulting in less crowding and less disappointment for persons with special interests. The information contained in these Tables will be of benefit both to those with scientific or specialised interests as well as to the general public.

Thus, so far from resulting in overcrowding during the rush months, such Tables would actually produce a levelling-out effect, both to the benefit of the sanctuary/park/reserve administration and to the visitors themselves. Many other questions affecting personal clothing to be worn, equipment to be taken and so on can be effectively and concisely answered in such a Table.

In the first place, a separate Table is necessary for each sanctuary/park/reserve, to be drawn up by the administrative officers and those best acquainted with local conditions. Then a comprehensive Table showing the sanctuaries/parks/reserves of a country, preferably region by region, giving monthly index figures only, could be made, thus enabling visitors to plan beforehand a tour to include several places in the order in which the most favourable conditions for their particular objectives could be found. If such Tables could be internationally accepted and standardised, considerable advantages would result.

A Table for a sanctuary/park/reserve, once made, need not remain as a rigid and permanent fixture: amendments and modifications can be made after a study both of human and of wild life interests. In cases

where disturbance by visitors might be harmful, such as the breeding seasons and localities of rare species, this item of information could be excluded from the Table. Improvements in all-weather roads and accommodation may enable an up-grading of a low-indexed month to a higher rating to be made.

Two specimen Tables are given: (i) a Table for Kaziranga Sanctuary in India, with which the writer has been closely associated for over thirty-four years, and (ii) a comprehensive Table for the whole of India showing the chief wild life sanctuaries region by region.

BEST MONTHS OF THE YEAR FOR VISITING KAZIRANGA
SANCTUARY, ASSAM

(Altitude 250 feet above sea level, Annual Rainfall 80 in.)

Month	Index*	Weather	Temperature in C°		Remarks
			Max.	Min.	
January	4	Fine, cool	75	45	Early morning mists. Dry. Afternoon visits better.
February	5	Fine, cool	80	55	Grass being burnt off. Best time.
March	5	Fine, cool	85	60	Grass burnt off. Best time.
April	4	Showers, warm	90	65	New grass growing up. Good time.
May	3	Rains start	95	70	Conditions uncertain. All right if dry.
June	2	Rains	95	75	Only small areas of Sanctuary may be visited, where a few rhino graze.
July	2	Rains	95	75	do.
August	2	Rains	95	75	do.
September	2	Rains	95	75	do.
October	3	Rains finish	90	65	do. Improving.
November	4	Fine, cool	85	55	Swamps boggy, grass high in places. Improving.
December	4	Fine, cool	75	30	Early morning mists. Drier. Afternoon visits better.

* Key to Index Numbers: 5 = Best time of all; 4 = Nearly as good; 3 = All right, but less good; 2 = Possible, not fully recommended; 1 = Just possible at times, not recommended; 0 = Impossible, or not allowed, or closed.

A COMPREHENSIVE TABLE SHOWING THE BEST MONTHS OF THE YEAR FOR VISITING INDIA'S WILD LIFE SANCTUARIES AND NATIONAL PARKS

Month	Elir Forest	Kapileo Ghana	Deohigam	Corbett Park	Chandra Prabha	Kanha Park	Shivpuri Park	Hazaribagh Park	Jaldapara	Kaziranga	Manis	Bandipur	Ranganthitoo	Mudumalai	Vedanthangal	Periyar
January	5	2	1	3	4	3	4	4	4	4	5	4	2	4	5	5
February	5	2	1	4	5	4	5	5	5	5	5	4	2	5	4	5
March	5	1	3	5	5	4	4	5	5	5	5	4	2	5	3	5
April	5	1	4	5	5	5	4	5	5	4	3	5	2	5	2	4
May	5	1	5	4	4	5	4	5	4	3	2	5	2	5	1	4
June	3	1	5	0	3	4	4	3	2	2	1	4	4	3	0	3
July	1	4	5	0	3	1	5	2	1	2	1	3	5	2	0	2
August	1	5	5	0	2	0	4	2	1	2	1	3	5	2	1	2
September	1	5	5	0	2	0	4	2	1	2	1	3	3	2	2	2
October	2	5	5	0	3	0	4	2	2	3	3	3	2	3	3	2
November	3	2	3	1	3	1	4	3	3	4	5	4	2	4	4	3
December	4	2	1	2	4	3	4	4	4	4	5	4	2	4	5	4

This system of Information Tables has (commendably) been adopted by the Indian Board for Wild Life and recommended for use to all State Governments. It has been utilised in full by the Department of Tourism, Government of India, in its recently published *Wild Life Sanctuaries in India*. The system has been sent to the International Union for the Conservation of Nature, which has acknowledged its great possibilities. It has also been sent to the National Park Service of America and to the Department responsible for the administration of national parks in Canada: both these countries have expressed their deep interest in the possibilities of such a system.

If this system of Information Tables, with index numbers from 0 to 5, could be universally adopted throughout the world in all guide books and leaflets, there is no doubt that a great deal of work and time would be saved—to the great advantage of everyone concerned with the administration of parks, and to the benefit of travel agencies and the general public.

REFERENCES

- Butcher, D. (1951): *Exploring Our National Parks and Monuments*. Boston, U.S.A.: 266-271.
- Cabalane, V. H. (1951): Management of Large Nature Reserves. I.U.P.N. Technical Meeting, The Hague.
- Gee, E. P. (1952-56): The Management of India's Wild Life Sanctuaries and National Parks, *J. Bombay nat. Hist. Soc.* 51 (1): 1-18; 52 (4): 717-734; 54 (1): 1-21.
- Indian Board for Wild Life: Proceedings (1952): 53-64; (1953): 1-29; (1955, March): 55-60; (1955, July): 46-55; (1956): 95-109; (1957): 153-162; (1958): 183-193; (1959): 72-77; (1961) Munro, D. A. (1949): Notes on Game Biology (Wildlife Management in Canada).
- National Park Service (1957): Information Handbook.
- Zoologica (1956): Introduced Mammals and their Influence on Native Biota. Scientific Contributions of the New York Zoological Society, 41 (4).

(Concluded)