

# Partial county development plans as a means for preserving wild reindeer habitats in Norway

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*Abstract:* Norwegian wild reindeer habitats are threatened by human intervention. Wild reindeer habitats are joint region wide common pool resources (CPR). Municipalities may be free-riders to that resource if they prefer investments boosting municipal economy despite negative consequences for wild reindeer as a regional resource. Partial county development plans, following the rules of the Planning and Building Act (PBA), are a means that may combine preservation of habitats and development. In order to analyze such plans, theory on CPR management is applied to spatial development planning in the Rondane and Hardangervidda wild reindeer areas. It is shown that the nested system is in accordance with most of Ostrom's principles. Still, a joint Planning Board ought to be established at Hardangervidda and a partial county plan for the whole wild reindeer area there ought to be established. It is recommended that regular monitoring of interventions and planning is established. Finally, a system or mechanism for low cost conflict resolution is needed; but is not easily included into a system based on official actors at different levels, the planning and building act and public anticipation on equal management. The last point is important for mutual acceptance of restrictions on own activity.

**Key words:** common pool resource (CPR), Hardangervidda, regional planning, *Rangifer tarandus tarandus*, Rondane, second homes, spatial development planning, tourism, wild reindeer.

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## Introduction

As late as 1900, large and quite intact mountain areas existed in South Norway. Throughout the 20th century these areas were reduced and split by human intervention. Today wild reindeer areas (Fig. 1) usually span a number of municipalities, many of which face problems due to declining populations and reduced commercial activity in traditional rural economies. Boosting local economies by increasing the number of second homes in the mountain areas is one option for increased economic activity. From the individual municipality's point of view it is, for tax and employment reasons, rational to keep the economic activity within

their municipality. In this way the municipalities becomes free-riders; they benefit from increased economic activity and other municipalities providing space for the joint wild reindeer herd, on which their inhabitants may hunt. The future of Norwegian wild reindeer herds depends on how the land is managed at a regional scale, especially concerning tourism (Nellemann *et al.*, 2003; Andersen & Hustad, 2005). Similar problems, related to logging, mining, industrial activity and tourism are encountered in relation to North-American caribou herds, as in Alberta (Dzus, 2001), British Columbia (BC Forest Facts, 2004), Nunavut

(Nunavut Planning Commission, undated) and the Beverly and Qamanirjuaq herds (Beverly and Qamanirjuaq Management Board, 2005).

Basically these problems are about eco-regions and the fact that human jurisdictional borders often cuts across such regions. This issue is relevant to more species and habitats than wild reindeer and mountain areas. Buck (1989) elaborated the problem in relation to fish resources and estuaries. Rydin & Matar (2006a) focus on forests, whereas Stokke (2006), Galaz (2006) and Rydin & Matar (2006b) discuss the problem in relation to watersheds and water management.

The aim of this article is to analyse regional development planning as means for mitigating these problems and to examine the extent to which knowledge about long enduring institutions for common pool resource (CPR) management better such planning.

### **Planning and common pool resource (CPR) management**

#### *Maintenance of common goods – a basic reason for planning*

Spatial development planning is a public process that results in a planning document indicating where new activities may or not take place. A basic reason for public planning, as spatial development planning, is to reduce negative externalities caused by individual human action and favour societal goals - common goods (Klostermann, 1965; Friedmann, 1987) but in the 15-20 first years after the Building Act was launched in 1965 it had little influence on the spatial development of Norwegian mountain areas (Arge, 1978; Fiskaa, 1996). However, in the mid-1980s things began to change when wild reindeer and the condition of mountain areas entered the agenda, a fact apparent in a number of contested planning cases and in the initialisation of new regional development planning processes (Rønningen, 1984; Skogland 1984; Bråtå, 1985; 2001). Knowl-

edge about CPR-management will be valuable for spatial planning since CPR-literature deals with theoretical and practical aspects concerning how to cope with the problem of free-riding, aspects not always explicitly focused in spatial development planning but which are interesting for a successful regional planning. These aspects may be quite detailed or similar to “blueprints” which increase their value as “tool” for actual planning, but on the other hand that may also be problematic, because contexts and actors varies. Another challenge is the quite formal structures and procedures in spatial development planning compared with the more actors focused CPR-management. Merging those traditions is conflicting the expectations on equal treatment, which is basic for bureaucracy and public planning. Still, some elements in CPR-management are already included in the planning process, such as coordination across borders, but without receiving enough attention and consciousness with regard to basic problems and conditions. The spatial planning system as being a formal system has evolved and new actor oriented elements are included in the legislation and day-to-day practice, for example by emphasizing public participation. It therefore seems apparent that knowledge about CPR-management may increase the value of regional plans.

CPRs are usually held jointly by a number of individuals or groups. Nobody controls the entire resource, but individual extraction from the resource may influence its long term maintenance. From an individual point of view it may be rational, especially in the short run, to extract as much as possible of the resource (Olson, 1965; Hardin, 1968) but this often undermines the long term extraction of the resource and cause problems for others. The challenge is to make interested parties aware of possible problems and to accept short term and individual restrictions in order to gain long run yields. In short, temptations to free-ride

must be tamed in order to maintain a common good (Klostermann, 1965; Saglie, 2006).

The coordination problem is pinpointed by Olson (1965) who suggests that unless there is coercion or some other special device to make individuals act in their common interest then rational, self-interested individuals will not act to achieve common or group interests. Still, a large number of cases describe and analyse how the cooperation problem is overcome (Ostrom, 1990; Bråtå, 2001; 2005). Ostrom (1990) found a number of similarities among long enduring and successful cases of CPR management and proposed some design principles for such management that could be used in the future. Stein *et al.* (2000) criticizes the use of Ostrom's design principles. They argue that focusing on the design principles lead us to miss important contextual factors; that the principles are considered as blue prints and that they are based on normative criteria. Meinzen-Dick (2000) agrees the criteria are normative, and points that "success" and "failure" in management can be judged differently by individual actors or groups. Ravnborg (2000) and Kurian (2000) emphasize that the design principles to a large extent are derived from situations quite removed from "the State and market", often in developing countries, and especially management of irrigation. This makes them less relevant for a number of situations. Ostrom (1995) and Singleton (2000), on the contrary, see the principles as a way of understanding CPR systems, rather than being a blueprint for action.

The design principles do not escape normative aspects on success and failure and such elements may influence the selection of design principles. Still, it is reason to believe that design principles point to aspects worthy to be examined (Bråtå, 2001). This is the point of departure for this article: the design principles are one way of understanding regional spatial development planning, and a way to im-

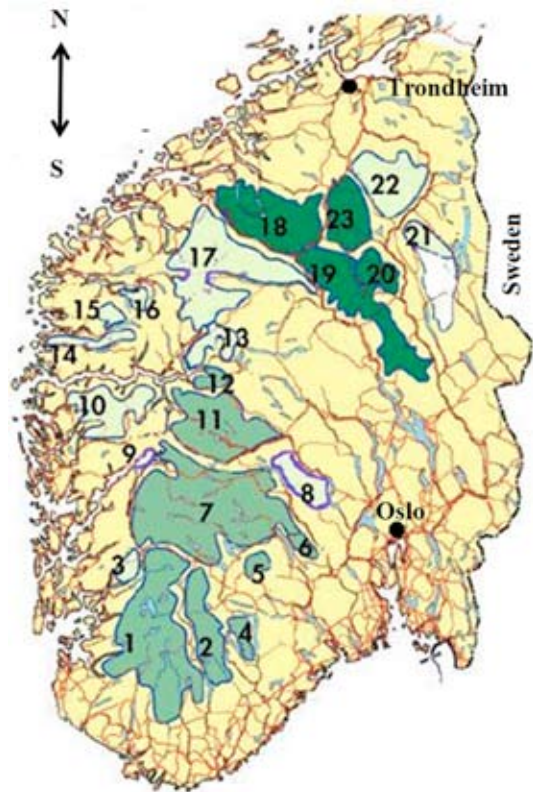


Fig 1. Map of South Norway with Hardangervidda (no. 7), Rondane (no. 19) and other wild reindeer areas in Norway. (Source: The Norwegian Wild Reindeer Council/Villreinerådet i Norge, <http://www.villreinen.no/Villreineradet/Villreinomraadene.htm>).

prove such planning by introduction of new perspectives. This is interesting because many CPR-management studies (e.g. Ostrom, 1990) concentrate on the resource but hardly discuss how to plan the resource system.

A potential problem for analyses across the arenas of big game management (the resource) and spatial planning (the resource system) is that spatial development planning is a means of coordination, whereas big game management is about one single resource type where interested parties usually have more in common than in spatial development planning. This may not turn into a problem because the basic concern is human interaction and

long term management of a 'common good'. Another interpretation problem may be that Ostrom's (1990) principles are to a large extent based on individuals as interested parties, whereas the municipality is a complex array of interests. Nonetheless, I have concentrated on how a municipality as a unit acts towards other public actors and is aware of the fact that a number of discussions are going on within municipalities throughout all stages of planning processes. By analysing the possible advantages of the design principles in such situations the principles are introduced to new, and may be more complex contexts, including the context of a well organised and planned western society. This broadens the possible understanding and use of the principles and turns into a counter argument against those, as Ravnborg (2000) and Kurian (2000), arguing that they are used in too simple situations.

#### *Design principles for successful long enduring CPR institutions*

In the following, Ostrom's (1990) design principles are, as a point of departure, elaborated with regard to the theme of this article.

*Clearly defined boundaries* are important because they define the right to use the resource and who should be included in CPR-management (Ostrom, 1990). Landowners are entitled to sell plots (e.g. for second homes) and are the primal group of actors for a CPR-management since their decisions directly influence the management of the land. The boundaries of the CPR-resource include the landowners, and the municipality shall, through the spatial planning process, judge the added consequences of development proposals put forward by these landowners. In that process county actors and other municipalities may object to plans that conflict with societal goals and the boundaries then define relevant landowners, other interested parties, municipalities and counties.

*Congruence between appropriation and provision*

*rules* are important, as well as their adjustment to local conditions (Ostrom, 1990). In spatial development planning this is the detailed instructions laid down for new and ongoing activities.

*Collective-choice arrangements* may tailor rules to local circumstances and to particularities of individual resources (Ostrom, 1990). First-hand experience from implementation of rules is important for commitment and judgements on their function. Revision, following the PBA, is important because boundaries and rules may be adjusted to new knowledge. Processes, when developing the partial county plans and by subsequent revisions of those plans, are anticipated to increase commitment to the plans and smooth implementation.

*Monitoring* of the resource, its conditions, and how management influences the development of the resource, is important. Monitoring by appropriators may increase data credibility but external monitoring may also be important. Studies suggest that jointly accepted knowledge helps the management process (Ostrom, 1990; Bråtå, 2001; 2005).

Appropriators who violate operational rules are likely to be assessed *graduated sanctions* by other appropriators or official authorities (Ostrom, 1990). This may restrict the temptation to free-ride, but those breaking joint rules ought to face the same level of sanctions because people seem to accept restrictions if they feel all are treated equally and that sanctions are graduated and fair. When this is not the case a joint management may be undermined (Bråtå, 2001). An objection is the most powerful sanction, whereas a comment is a weaker one. The option to raise objections was one reason for partial county plans. Zoning is supposed to direct the planning and be a warning on sanctions.

Access to low-cost *local mechanisms for conflict resolution* can be seen to facilitate the long term endurance of CPR-management (Ostrom,

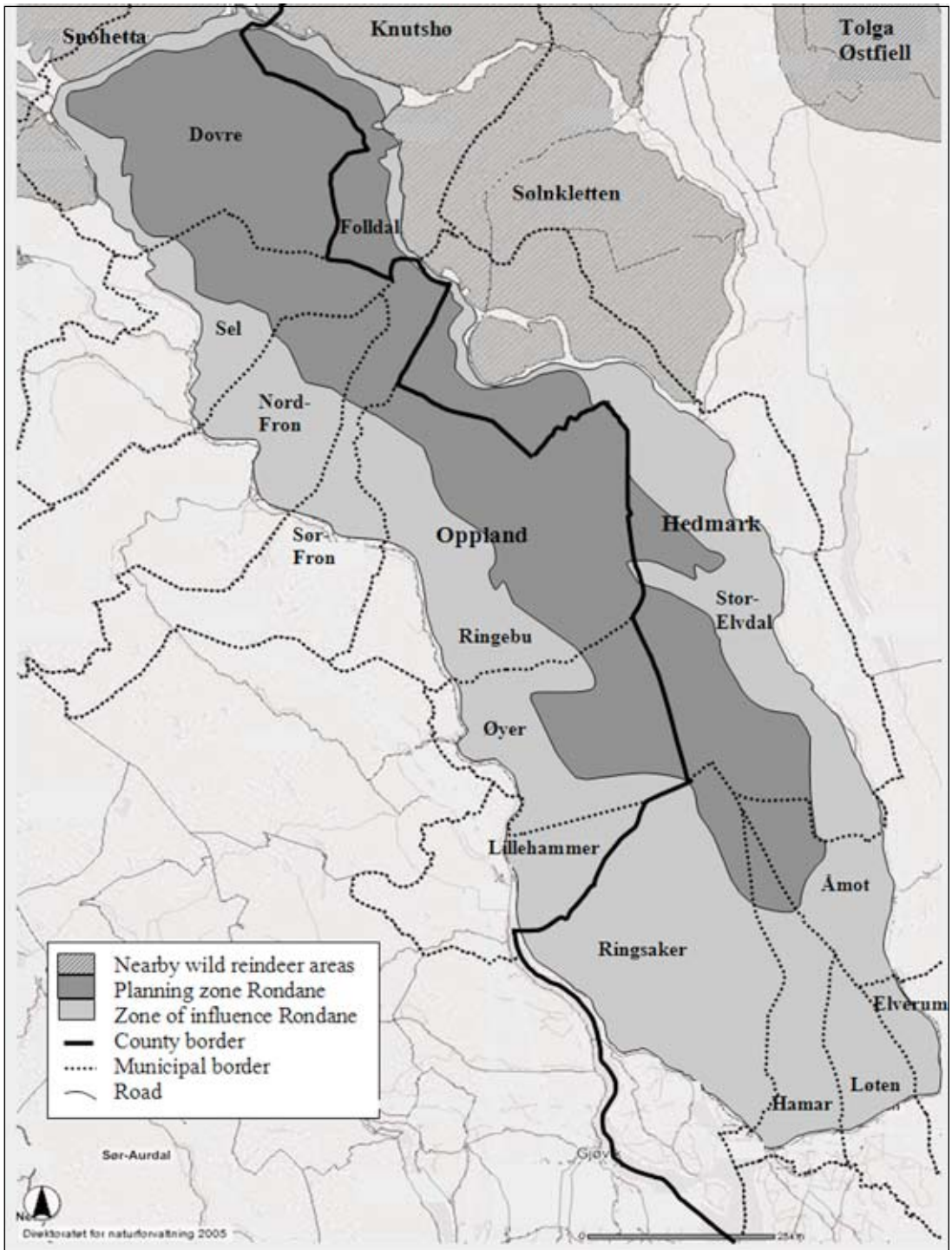


Fig. 2. The Rondane County Development Plan, simplified 2000 version, and nearby wild reindeer areas.

1990). A joint board has been important for such conflict resolution in wild reindeer management in the northern part of Rondane since it helped facilitate the generation, over time, of mutual trust (Bråtå, 2001).

The *rights of appropriators to develop their own organisations* is positive (Ostrom, 1990) and has been, for example, important to the development of Norwegian wild reindeer management (Bråtå, 2001; 2005). Norwegian citizens have a democratic right to organise and at local and county levels a number of interested parties have done so. A variety of organisations, including ones for landowners, give people different options to participate in the planning process according to PBA prescriptions.

Most long enduring CPR-systems are included in *nested enterprises*. A nested enterprise means that an actor has formal and informal relations to other actors. Establishing rules at one level without appropriate rules at other levels will produce an incompetent system that may not endure in the long run (Ostrom, 1990). Each level and organisation ought to act as prescribed in the PBA or be developed through regional practise. Partial county development plans for CPR-management are based on a system of nested enterprises: County development plans have instructions for municipal master plans, which have instructions for local plans and in turn prescribe accepted interventions by individual landowners.

### Methods and data

The article uses Norwegian data on municipal and county development plans, and planning processes. Spatial planning data were collected for case studies in the Rondane and Hardangervidda wild reindeer areas (Fig 1).

At Hardangervidda the studies focused on the municipalities of Hol and Nore & Uvdal in the eastern part of Hardangervidda, due to their important winter forage areas and the Numedal and Hallingdal valleys popularity as

tourist destinations. The Rondane material is based on documents from all twelve municipalities in the area. Documents include all types of written material related to municipal and county development plans: letters, plans, minutes, reports, etc. The period studied is from the 1970s until 2003. Interviews with politicians, planners and wild reindeer managers supplement documentary sources (Bråtå, 1997; 2001; 2005; 2006). An analysis of electronic data provides knowledge on the number and location of second homes in Rondane at different time intervals before and after the introduction of the partial county plan (Bråtå & Overvåg, 2006).

### The Rondane region

The Rondane region covers 7100 km<sup>2</sup> and comprises twelve municipalities in the two counties, Hedmark and Oppland, in South Norway (Fig. 2).

Surveys in 2006 revealed 4100 wild reindeer in the winter herd; the long term goal is 4500.

Outdoor recreation is a major activity and the number of second homes (cabins, cottages etc.) has increased considerably. In the region as a whole there were 17 816 second homes by the end of 2005. The majority are located at the fringe of the region but serve as points of departure for outdoor activity that reaches deeper into the region. Considerably more second homes are built in the western and southern than the eastern and northern parts of the region (Bråtå & Overvåg, 2006). By the early 1980s county governors and mountain boards (managers of crown land) became worried about the future of wild reindeer habitats, and a report on the range used by wild reindeer, and human interventions, in the Rondane region was drawn up (Bråtå, 1985). The report was generally accepted and used as an argument against development proposals, and by the mid-1980s the plight of wild reindeer areas was at the forefront of planning debates.

Despite this no regional development plan to guide future planning existed (Bråtå, 2001).

Thus a major question was how to inspire each municipality to closely evaluate its interventions and support the long-term regional maintenance of the wild reindeer habitat. The answer was a joint partial county development plan, including the relevant parts of Rondane in Hedmark and Oppland. That plan was initiated in 1986 by Erik Winther, mayor of the Ringebu municipality and county agencies. A partial county development plan was selected because municipal participation during the preparation was anticipated to create greater commitment and because the municipalities could influence the guidelines set out to guide their future planning. A partial county development plan justified power against free-riders. The nature conservation act was the alternative, but feared by municipal politicians due to little influence on joint rules. Despite good intentions, not all municipalities, mayors and chief executive officers were involved in the planning process. Nevertheless, all municipalities formally adopted the plan which was approved by the Ministry of Environment (ME) in 1991.

The overall goal was to maintain wild reindeer habitat and to allow new development that did not conflict with wild reindeer. The range used by wild reindeer was defined as a *planning zone* (Fig. 2). Existing activity within that zone could continue but new interventions were not allowed if they conflicted with wild reindeer habitat. The rest of the region – the space between the planning zone and surrounding valleys – was defined as a *zone of influence*. There new impacts were allowed if they did not increase disturbance in the planning zone. New second homes in that zone, a major theme, were supposed to be located as distant as possible from the planning zone.

Instructions guided the planning for each zone. The Rondane Plan included the setting

up of a Planning Board comprised of municipal, county and county governor representatives from both counties. The board's aim was to guide interested parties in applying the Rondane plan and to promote its follow-up. Another task was to calibrate judgments of plans across county and municipal borders.

During the 2000 revision, the *planning zone* was enlarged due to changes in land use by wild reindeer. The *zone of influence* was divided in two subtypes taking into account that land with substantial interventions had to be judged differently than areas with few impacts. Comments from municipalities were a major reason for changing the zone of influence.

The partial county plan's function as a steering document depends on voluntary implementation by municipalities or the county authorities' use of it for objections. After an introductory period the partial county development plan reduced the number of new interventions in Rondane. In fact, second homes were often located further away from the planning zone or the numbers of second homes in municipal development plans were reduced. The primary reason was the county governor's use of the plan as a basis for objections. When municipalities noticed the objections, they omitted some planning proposals in conflict with the partial county development plan. The temptation to become a free-rider was counteracted by objections, and the municipalities experienced that planning proposals were considered quite equally across municipal and county borders. This was potentially a problem because historically, most economic development in Rondane had taken place in Oppland, causing people in Hedmark to view new restrictions as unjust. Quite equal considerations are due to the efforts of the Planning Board. It has exercised a policy of some give and take, but has been restrictive in terms of new development proposals. The Planning Board has also counteracted a general problem of many

partial county development plans, i.e. that they easily are forgotten.

Some implementation problems exist: such as how close to the planning zone new development plans can be allowed without posing threats to wild reindeer. Additionally, the partial county development plan is not a conservation plan but a plan that is supposed to allow some intervention. In general, few new harmful impacts are allowed for in the planning zone and in the zone of influence new impacts are often located further from the wild reindeer area than before the plan was adopted (Bråtå & Overvåg, 2006).

### **Eastern part of Hardangervidda**

#### *Controversies arose in the 1980s*

Hardangervidda is approximately 8000 km<sup>2</sup> and is considered the largest mountain plateau in Europe. The number of wild reindeer has varied from 21 700 in 1979 to 5000 in 2002. Long-term goal is 8000–10 000 animals. Fig. 3 shows the north eastern part of Hardangervidda and the area subject to the county development plan in question.

At *Dagalifjell* the number of second homes during the period 1950–2004 increased from 77 to 1006. Most of the area is located in the municipality of Nore & Uvdal but the northern part is within the borders of Hol. The introduction of an environmental division at the County governor in 1982 caused conflicts in the 1980s between the division and the Nore & Uvdal municipality concerning wild reindeer issues. Despite the municipality having planned to keep migration routes free of new second homes the governor feared that new development would reduce the use of *Dagalifjell* by wild reindeer.

Conflicts caused the ME to initiate a regional analysis of the consequences of existing and new tourist facilities in the municipalities of Nore & Uvdal, Hol and Tinn. The ecological analysis pointed out the importance of *Dag-*

*alifjell* for winter forage (Skogland, 1984). If wild reindeer were no longer able to use remaining eastern mountain areas of Hardangervidda the winter carrying capacity for all of Hardangervidda would decrease by 13% to 17%, or 1500–2000 animals (Skogland, 1984). This alarmed the Directorate for Wildlife, which strongly opposed development proposals and advanced the need for coordinated spatial planning. During the following decade new second homes and other facilities were accepted at the fringe of *Dagalifjell*, in accordance with proposals in Skogland (1984). Still, several proposed second homes were also stopped due to objections from the county governor.

At *Lufsjåtangen* wild reindeer were not a theme in development plans throughout most of the 1980s but entered the agenda in the late 1980s due to the county governor's objections to a plan for second homes. In 1992, the ME supported an objection against a development plan due to the importance of *Lufsjåtangen* as winter forage area and as a passage to the *Blefjell* wild reindeer area (Fig.3).

#### *County development plan for eastern Hardangervidda and municipal planning*

In February 1993, the ME requested the counties of Telemark and Buskerud to prepare a partial county development plan for eastern part of Hardangervidda. The ambition was to clarify future land arrangements and the needs of wild reindeer (Buskerud County & Telemark County, 1995). The municipalities adopted the plan, which was approved by ME in 1998. A *wild-reindeer zone* was defined where wild reindeer had priority (Fig. 3). Another zone comprised surrounding land including existing second homes and areas where new second homes were planned, the "*second homes and tourism*" zone. Instructions were laid down for each zone. *Sangerfjellet*, *Dagaliåsen* and *Hallandsfjell* which were formerly used by wild reindeer, especially at population peaks, were



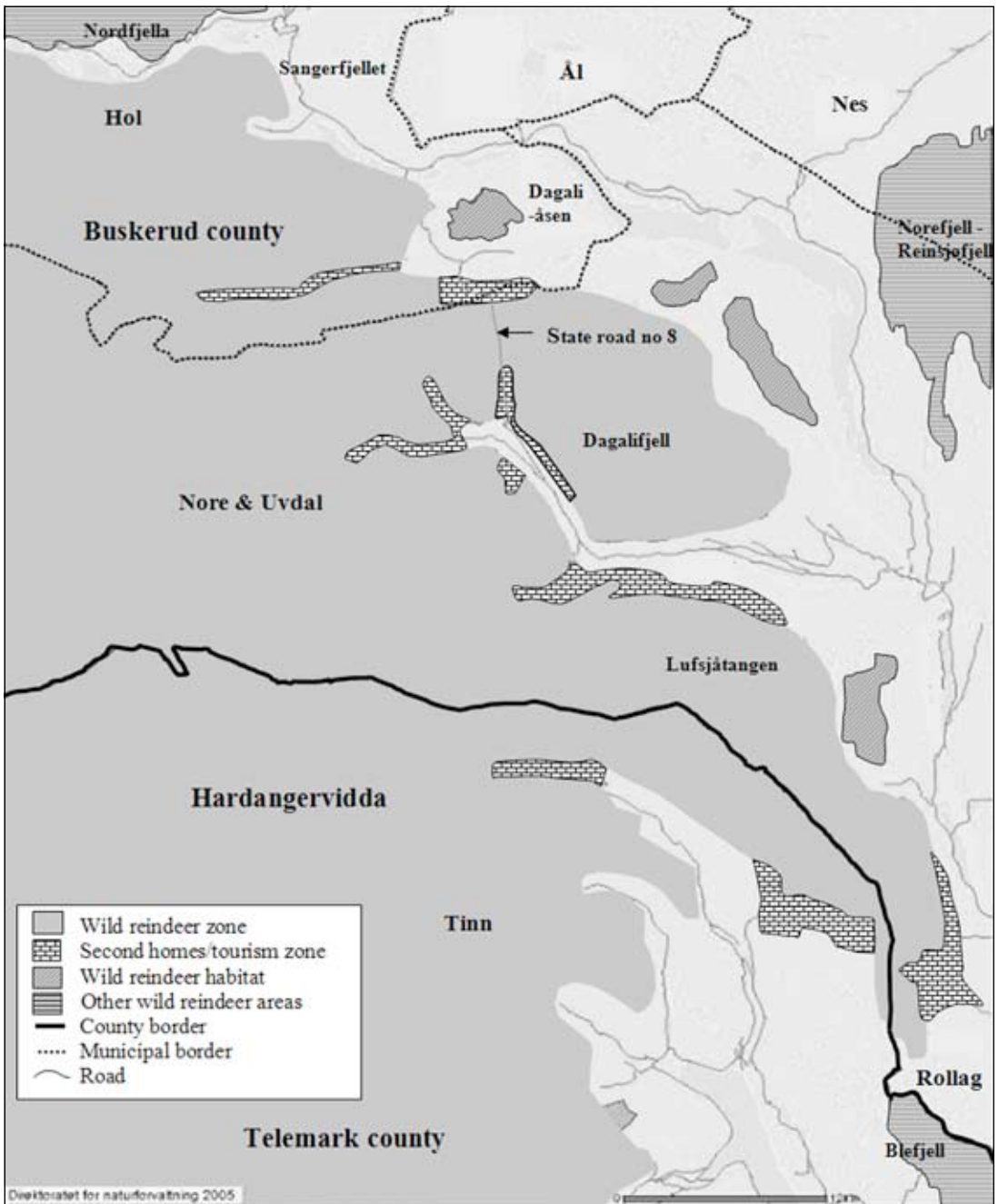


Fig. 3. The Hardangervidda East County Development Plan, simplified 1995 version.

not included in the area governed by the plan and no planning board was established.

During the preparation of the partial county plan, in 1995, the elaboration of the Municipal Master Plan for Nore & Uvdal started, and wild

reindeer was a theme from the beginning. The county governor announced he would place a high priority on the partial county development plan when considering municipal proposals. Municipal planners used the Hardangervidda

East Plan to dismiss or reduce landowners requests for new second homes. Although the municipality reduced the number of new second homes planned, second homes and wild reindeer became a theme at the public hearing in 1997 because a substantial number of new second homes were still proposed. The county governor objected to 240 new second homes proposed at Dagalifjell due to conflicts with wild reindeer. At Lufsjåtangen the environmental division objected to new second homes outside of existing local development plans due to wild reindeer and the number of new second homes there was reduced. The county governor did not object to development plans in zones for second homes and tourism.

Throughout the planning process in Nore & Uvdal some confusion emerged: were there restrictions on further development within the zone for second homes or not? Planning proposals in Telemark increased the need for discussion on how to interpret the partial county development plan. Clarifying these aspects and the partial county development plan's role for municipal planning became a task for the county. They emphasized that proposed development within the zone of second homes and tourism was in accordance with the partial county development plan and that no reason for objection existed. The county was not sure about the knowledge base on which the zones were laid out. At negotiations a compromise was achieved, allowing for new second homes at the fringe. These negotiations led to a joint understanding of the partial county development plan and the environmental division learned they had to be cautious about objections in zones allowed for tourism in the partial county development plan.

The 2003 Master Plan for Hol proposed extensive development of second homes at their part of Dagalifjell but located in the zone for second homes and tourism defined in the partial county development plan. The county

governor and others objected, citing a conflict with the needs of wildlife. The majority of the second homes were kept as proposed.

### **Discussion**

The partial county plan maps clearly define the outer limits, the *boundaries*, of the common pool resource and consequently the relevant counties and municipalities. Still, at the early phase of the Rondane Plan, these limits were not obvious: initially only municipalities at the core of the region were supposed to be included and one plan for each county was proposed. A ME decision to develop a plan for the whole region paved the way for joint management (Bråtå, 2001). Congruence between the extension of the resource, the wild reindeer, and the space, on which they depend, was achieved. This is not the case for Hardangervidda, where only a part of the wild reindeer area, still an important one, is subject to joint planning instructions. As a consequence, regional actors now aim at a plan for the whole wild reindeer area.

Boundaries not only define relevant actors but also the possibility for sanctions against free-riders. In both mountain areas the most important part of the wild-reindeer areas are clearly defined. The problem is adjacent areas, where new activity can cause disturbance that stretches into the wild-reindeer area. At Hardangervidda East this problem was handled by omitting the most extensively developed parts from the plan or by defining them for tourism. Still, in the early phase of implementation, it was unclear how to judge plans proposed in the zone for tourism. Objections, negotiations and interpretation by the county were necessary before a joint interpretation was established. In Rondane new tourist facilities are supposed to be accepted in the zone of influence if the impacts are not harmful to the reindeer. In this way the planning is adaptive to the changing land use of the wild reindeer but it is made

difficult because a large number of plans have to be judged concerning possible impacts. The border of the common pool resource may be debated, which is a threat to a successful CPR management (Ostrom, 1990; Bråtå, 2001).

Partial county plan development processes, following the PBA instructions, brought about joint instructions adapted to the local conditions (Bråtå, 2001). Consequently, Ostrom's (1990) *second point on congruence between appropriation and provision rules* is fulfilled. This is important as it defines how municipal planning proposals, and other proposed interventions, are supposed to be judged. The partial county plans increased the number of instructions which municipalities had to consider but no new planning resources were introduced. In the Rondane case the counties, the principal owners of the partial county plan, allocated some resources to the Planning Board. Some additional resources are allocated for individual studies, but resources aiming at increasing the development part of the plan, as activities not harmful to wild reindeer, are not allocated.

The planning processes when developing the partial county plans, and the subsequent revisions, are examples of *collective choice arrangements* as defined by Ostrom (1990). Revisions have increased the focus upon the plans and adjustment of the boundaries (Bråtå, 2005).

New knowledge was important for the initiation of the partial county plans (Skogland, 1984; Bråtå 1985). Still, although individual reports are produced when needed, no regular *monitoring* of the planning exists. It can be argued that annual monitoring is not needed because the spatial plans last for at least four years. However, it may be wise to monitor regularly because current joint knowledge can be an important point of departure for further action (Friedmann, 1987).

The planning processes, but most of all objections, have influenced a number of proposed interventions by which the municipali-

ties have learned that the plan will actually be enforced. Proposed interventions in the most protected zone in both mountain areas faced equal and *graduated sanctions* which mean that the formal power put to use by county level agencies were adjusted to how much plans conflicted with the instructions laid down in the county development plan. This is, despite some discussions, also the case for the tourism zone at Hardangervidda. In the zone of influence in Rondane it is implied that sanctions are graduated: Planning proposals not in conflict are accepted. Other proposals have to include mitigating efforts, whereas those in conflict face objections. The Planning Board is important, as it tries to facilitate equal judgments across municipal and county borders, which may increase commitment to the plan. Their involvement in regional development planning and their knowledge about what is accepted as just sanctions are part of it, but has been criticised. CPR-studies in general seem to emphasize the importance of such joint boards and the lack of such a board at Hardangervidda is thus a potential weakness.

The *conflict resolution mechanisms* are the ones defined in the PBA and established through traditions in the counties, as regular meetings between county agencies and municipalities. The Rondane Planning Board takes part in conflict resolution. In the first elaboration of the Rondane Plan informal contact between politicians at county and municipal levels facilitated the resolution of conflicts (Bråtå, 1997; 2006). Still, no local low-cost arenas for conflict resolution exist. Conflicts often become a formal matter, which is a weakness for a long enduring CPR-management.

Norway has a *free right to organize*, and a number of organizations exist, but the question is the real access to situations where decisions are made and influence. It is linked to the previous point that no formal, local low-cost conflict resolution mechanism exist. Still, it is difficult

to see how new organisations could influence the CPR-management since it is based on formal institutions and rules within the spatial development planning system.

Partial county development plans are based on the Norwegian system of *nested enterprises* at different levels and the PBA. The CPR-management is then influenced by that system's weaknesses and strengths. It is a weakness if paramount goals at national and regional levels only are implemented by objections, which were the case for wild reindeer issues in the 1980s. Joint plans for large mountain areas, adapted to local circumstances and based on municipal commitment, was a means to come a step further. A nested system based on planning is important due to predictability and it enables public actors to sanction free-riders. The last point has been important for a reduction of new harmful interventions in Rondane, although local and municipal commitment also seems to reduce such interventions.

## Conclusion

A CPR-management process based on a system of nested enterprises and the PBA has in Rondane reduced the number of new potentially harmful interventions whilst allowing for further development. Studies of the planning experiences of Hardangervidda East indicate the same. A common pool resource perspective shows that the system described is in accordance with most of Ostrom's (1990) design principles. These principles, and CPR-management theory, supplement the implementation of regional plans. The basic element of public planning is to get from knowledge to action (Friedmann, 1987) and favour societal goals (Klostermann, 1965), whereas the basic problem of CRP-management is that unless coercion or some other device exists, individuals will not act to achieve common interest (Olson, 1965). At the level of individual municipalities this is managed through spatial development

planning following the PBA instructions. Regional plans may be one of the devices pointed to by Olson (1965), but they are more complicated than municipal plans due to a larger number of actors, and because joint action across juridical borders is presupposed. Lessons learned from actor based theory, as CPR-theory, give insight in factors that may gain regional planning and mitigate the coordination problem, despite the fact that the main actors are municipalities not individuals.

Although an accordance with Ostrom's principles exist, some notable elements remain to be implemented. Firstly, a joint Planning Board ought to be established at Hardangervidda and a partial county development plan for the whole wild reindeer area ought to be established. Secondly, regular monitoring of interventions and planning ought to be established at the regional levels. Lastly, a system for low-cost conflict resolution mechanisms ought to be established even though this may not be easily included into a system based on official actors at different levels, PBA prescriptions and the public's expectation that equal treatment will be a part of any system. The last point is important for mutual acceptance of restrictions on own activity.

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Kunnskap om forvaltning av fellesressurer øker forståelsen av regionale planer for villreinområder

*Abstract in Norwegian / Sammendrag* Norske villreinområder er truet av menneskelige inngrep. Villreinområdene er en regional fellesressurs, men kommunene kan bli gratispassasjerer i forhold til utnytting av denne ressursen ettersom de kan bli fristet til å vektlegge utbygging som gir lokaløkonomiske effekter, på tross av negative konsekvenser for villreinen som en regional ressurs. Fylkesdelplaner, som er basert på plan- og bygningsloven, er et virkemiddel som kan kombinere bevaring og utvikling. For å forstå slike planers muligheter og begrensninger analyses her fylkesdelplanene for Rondane og Hardangervidda øst i forhold til teorier om forvaltning av fellesressurser. Analysen viser at planleggingen og det offentlige systemet som er bygget opp omkring planene, er i tråd med de fleste av Ostrom sine prinsipper. Det bør imidlertid etableres et planråd for Hardangervidda og fylkesdelplanen der bør utvides slik at den omfatter hele villreinområdet. Det bør etableres et system med regelmessig kartlegging av planleggingen og effektene av det. Det bør også etableres et system som gir grunnlag for å løse konflikter på en enkel måte, men dette er ikke enkelt fordi planleggingen er basert på det offentlige planleggingsystemet og forventninger om like behandling av saker. Lik og rettferdig behandling av saker er viktig for at aktører skal kunne godta restriksjoner på egen aktivitet.